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ATTACHMENT M

RESULTS OF UNDERGROUND TANK LEAK DETECTION PROGRAM FOR PLANT B-1

LOCKHEED CALIFORNIA COMPANY
BURBANK, CALIFORNIA

SUBMITTED TO

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

APRIL 1985

Lockheed-California Company

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FROM
LOCKHEED-CALIFORNIA COMPANY
BURBANK, CALIFORNIA 91520

PREPARED BY
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April 5, 1985

STATEMENT OF SUPERVISION AND REVIEW

This underground tank leak detection program was conducted by Gregg & Associates, Inc., which is solely responsible for its contents. All aspects of this work including the planning, office and field data and sample collection, data compilation and evaluation, and report preparation were accomplished under the direct supervision of Dean O. Gregg, California Registered Professional Engineer. The geologic data, auger cuttings and samples, and geologic logs and evaluation were reviewed by Jay L. Smith, California Registered Geologist and Engineering Geologist.

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DATA SUPPLEMENT AUGUST 1985

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Preface

The California Regional Water Quality Control Board - Los Angeles Region (RWQCB) in a letter dated April 24, 1985 required Lockheed-California Company (CALAC) to perform inspections and other activities on 18 underground storage facilities at Plants A1, B1 and B6 and report on six of these facilities by May 22, 1985. A preliminary report for these six sump and clarifier inspections was submitted in May 1985 to the RWQCB. The RWQCB directive was in response to subsurface contamination detected and reported by CALAC during an extensive subsurface investigation conducted as part of Phase II of the Underground Tank Leak Detection Program. The Underground Tank Leak Detection Program and this supplemental investigation program were conducted by Gregg & Associates, Inc. of Huntington Beach, California.

This supplemental report (delineated by pink pages) describes findings and recommendations resulting from investigative activites on 26 CALAC sumps, clarifiers, and tanks (Table 1A, 1B, and 1C). This includes investigative and remedial activities on 8 underground storage facilities which CALAC has determined necessary in addition to activities on the 18 underground storage facilities required by RWQCB. The tables list the specific activities performed at each tank and summarize the findings. The pertinent work activities performed at each facility along with any recommendations are discussed under each Tank Number in Appendix C.

RESULTS OF

UNDERGROUND TANK LEAK DETECTION PROGRAM

FOR PLANT B-1

LOCKHEED-CALIFORNIA COMPANY

BURBANK, CALIFORNIA

1.0 INTRODUCTION

1.1 General Overview

In September 1983, Lockheed-California Company (CALAC) submitted an inventory of underground tanks to the California Regional Water Quality Control Board - Los Angeles Region (RWQCB). This inventory described the underground tanks at CALAC's 10 plants in Los Angeles County. In a letter dated November 18, 1983, the RWQCB informed CALAC that they would be required to conduct an underground tank leak detection program. In response to the November 18 letter, CALAC, in a letter to the RWQCB, suggested a schedule for compliance; the schedule was approved by the RWQCB in a letter dated March 13, 1984. The completion date for the Underground Tank Leak Detection Program for all of CALAC's facilities was established as January 11, 1985.

In a meeting between CALAC and the RWQCB on June 22, 1984, Mr. Novak of the RWQCB requested that CALAC submit program plans and Phase II reports for compliance on a plant-by-plant basis to facilitate the review and management of the program by the RWQCB.

Thus, the submittal of this Phase II report for Plant B-1 in Burbank is the third in a series of reports.

Because of the specialized nature, complexities and magnitude of the required investigation, CALAC sought professional consulting services, and selected Gregg & Associates, Inc., a Huntington Beach, California consulting firm specializing in hydrology, hazardous materials, and underground tank investigations, to assist them with the underground tank leak detection program.

1.2 Regulatory Overview

One of the responsibilities of the RWQCB is to protect the quality of ground water in the State of California through enforcement of the Porter-Cologne Act. Prompted by evidence of widespread underground tank failures in Santa Clara County, the RWQCB has undertaken a program of underground tank leak detection and monitoring. In 1983, the California Legislature passed the Cortese Bill (AB 2013) requiring persons storing hazardous substances in concrete sumps, non-vaulted buried tanks, or other underground containers to file a hazardous substance storage statement with the State Water Resources Control Board by July 1, 1984. The same year the California Legislature also passed the Sher Bill (AB 1362) regulating the storage of hazardous substances underground. The Sher Bill set certain standards for permitting, monitoring, compliance and maintaining of records, and procedures for closure of underground storage facilities. The Sher Bill also exempted cities and counties which had enacted ordinances before January 1, 1984, providing those

ordinances were adapted from the Sher Bill. Los Angeles County and the City of Los Angeles did adopt such ordinances; the City of Burbank did not. Thus, as Plant B-1 is entirely in the City of Burbank, County of Los Angeles, the agency responsible, after the RWQCB, for ensuring compliance with State regulations is Los Angeles County, through the Department of Public Works. Despite this complex jurisdictional structure, The County of Los Angeles and the RWQCB have had numerous meetings to provide consistency between their programs, guidelines, management and enforcement, and are administrating their respective programs with a cooperative spirit.

This Phase II report presents CALAC with the results of the execution of the RWQCB-approved Work Plan for Plant B-1 and other RWQCB directives It is CALAC's understanding that approval of this Phase II report by the RWQCB will also result in approval by Los Angeles County. This is because the spirit of cooperation between the agencies is high, and the intent of the programs adapted from the Sher Bill and the RWQCB requirements are similar. At this time it appears that Los Angeles County Department of Public Works will be the cognizant regulatory agency for long-term monitoring.

1.3 Plant Operations

Plant B-1 operational activities include aerospace and aircraft manufacturing. These activities require parts and components machining, deburring, and cleaning. These operations create the need for storage of diesel fuels and some hazardous materials

(such as caustics, acids and solvents), and the production and short-term storage of wastes in underground tanks (such as waste oils).

Many of the facilities in Plant B-1 were constructed before or during World War II. Construction of additional facilities has been sporadic and usually in surges since that time. Many of the steam-production boilers/heaters that were fired originally by diesel fuel are now largely fueled by natural gas with diesel fuel for emergencies.

1.4 Site Conditions

As indicated above, Plant B-1 lies entirely in Los Angeles County and in the City of Burbank. Plant B-1 is nearly triangular in shape (see Figure 1); is bounded on the east by Victory Place, which runs parallel to the Southern Pacific Railroad Valley Line, and the Golden State Freeway (I-5); on the north by Empire Avenue; on the west by Buena Vista Street; and on the south by Vanowen Street, which runs parallel to the Southern Pacific Railroad Coast Line. In the southeastern part of the plant, a small segment extends south of Vanowen Street and is bounded on the south by Victory Boulevard. The area can be characterized largely as industrial and commercial. CALAC is one of the largest industries in the area but there are numerous satellite industries locally.

The land surface slopes from about 640 feet elevation above Mean Sea Level (MSL) in the northwestern part of Plant B-1 to about 595 feet MSL near the southeastern part of the plant. The land

surface in the area slopes towards the Los Angeles River at about 70 to 80 feet per mile.

The site is underlain by thick deposits of younger alluvium of Recent (Holocene) and Pleistocene age. The alluvium consists principally of stream channel, fan, and basin deposits. Much of the deposits of Recent age are probably fan deposits from La Tuna Canyon in the Verdugo Mountains northwest of the plant. A driller's log of a well owned by the City of Burbank and located near the intersection of Vanowen Street and Hollywood Way indicates that the subsurface soils are largely granular. Typically, soils in the San Fernando Valley are sandy silts, sands and sandy gravels. Any clays are usually discontinuous and not extensive.

Ground water is about 140 to about 160 feet below land surface in the area. Mr. Robert Haw, Hydrologist with the City of Los Angeles Department of Water and Power, reported (oral communication, July 3, 1984) that the ground-water level in well 3841 H (Los Angeles Flood Control number) was about 140 feet below land surface on March 27, 1984. Well 3841 H is near the intersection of Clybourn Avenue and Victory Boulevard. Also, the ground-water level in well 3850 K, located near the intersection of Hollywood Way and Vanowen Street, was about 170 feet below land surface in November 1981. Since that time, ground-water levels have probably risen 20 or 30 feet in response to lower pumping rates by the City of Burbank and by increased rates of water spreading by the City of Los Angeles. Wells 3841 H and

3850 K are 1.6 miles southwest and 0.9 miles west, respectively, of the center of Plant B-1. Mr. Haw also stated that there are no indications of perched water or confined aquifer conditions in the area. Plant B-1 is in the San Fernando Ground-Water Basin.

1.5 Program Objectives

The objectives of the program were twofold: (1) to establish if the contents of underground tanks, sumps, and clarifiers have leaked into the subsurface, and if subsurface contamination is present; and (2) to establish a permanent leak detection system for these underground storage facilities, as appropriate. To achieve these objectives, a two-phased program was designed and is described here.

Phase I of the Underground Tank Leak Detection Program consisted of the following elements:

1 - Review of facility operating history;

2 - Inventory of underground tanks, clarifiers, and sumps;

3 - Review of available "as built" drawings of underground tanks, clarifiers, and sumps;

4 - Location of underground tanks, clarifiers, and sumps;

5 - Mapping of underground tanks, clarifiers, and sumps including location, orientation, geometry, adjacent utilities, and nearby surface objects;

6 - Review of available chemical analyses of contents of clarifiers;

7 - Evaluation of data base with regard to the RWQCB guidelines;

8 - Development of the Program Plan; and

9 - Presentation of Program Plan to and approval by the RWQCB.

Phase II consisted of the following:

1 - Sampling of selected tank, clarifier, and sump contents;

2 - Drilling and sampling soil borings;

3 - Installing monitoring devices (vapor monitoring wells and suction lysimeters);

4 - Laboratory analyses;

5 - Clarifier and sump inspections;

6 - Data evaluation; and

7 - Report preparation.

1.6 Report Organization

This report is organized basically into two parts - text and supporting appendices. The text discusses the project in general; Appendices A and B contain detailed discussions and data regarding each fuel tank and non-fuel tank, sump, and clarifier. Appendix C contains copies of the laboratory reports for the analytical work.

Section 1.0 of the text provides an overview of the underground tank program and of operations at CALAC Plant B-1; the Phase I Program activities are discussed in Section 2.0 with the Phase II Program activities in Section 3.0. Section 4.0 describes the Findings, and Sections 5.0, 6.0, and 7.0 discuss Conclusions, Recommendations, and Monitoring Program, respectively.

1.7 Terminology

In their more narrow definitions, a tank is a closed structure containing liquids; a sump is an open structure retaining liquids or used for recirculation of liquids; and a clarifier is an open

structure used to process and to provide for a flow-through of liquids. The term "tanks" is often used generically in this report to include all underground storage facilities (tanks, sumps, and clarifiers).

2.0 PHASE I PROGRAM

2.1 Site Records Review and Reconnaissance

A review of available records of Plant B-1 was made to identify and locate underground tanks, sumps, and clarifiers, and to ascertain past and present inventory of tank contents and operational history. It was found that most of the underground liquid storage facilities are, for the most part, non-fuel storage facilities. Some are clarifiers which are under current monitoring programs as part of waste water discharge permit requirements. Others are sumps which are used principally for the short-term holding of wastes or spills. There are also a number of underground tanks which are used for short-term holding of wastes or for solvents or other liquids. The fuel facilities contain diesel fuel.

Plant B-1 dates back prior to World War II. During that time and especially during the war, the installation of tanks and utilities was sometimes not documented on "as-built" maps and diagrams. In some cases, utilities installed during this and other periods of rapid construction were later modified or abandoned. In addition, many of the older drawings are at too small a scale for precise location of underground tanks and utilities. In general, however, available "as-built" drawings were helpful, especially for identifying utilities likely to be found near the underground tanks.

Preliminary walk-throughs were made with CALAC's Environmental Engineers as well as Plant and Field Engineers. The purpose of the walk-throughs was to obtain first-hand information from operations personnel as to precise location, history, and usage of underground tanks, sumps, and clarifiers. During these and other visits to the tanks, any site conditions or operational procedures which could possibly create subsurface contamination were noted. During the course of the walk-throughs and the detailed mapping of tanks, additional underground tanks, sumps, and clarifiers were located.

2.2 Tanks, Locations and Descriptions

A systematic survey was undertaken to locate and define the geometry of underground tanks and utilities. This work involved: 1) sounding the top and bottom of tanks to determine their vertical dimensions; 2) conducting a tank and pipe location survey using metal locators; and 3) mapping all pertinent above- and suspected below-ground structures (such as buildings, concrete pads, paved surfaces, piping, utilities, and tanks). The resulting data and field sketches were reduced to produce site maps for each tank or group of tanks. The site maps for the tanks are in Appendix A, Fuel Facilities, and Appendix B, Non-Fuel Facilities. Figure 1 (in pocket behind report text) is a map showing the general location of all underground tanks, clarifiers, and sumps at Plant B-1.

The internal geometries of the tanks were determined by sounding the tanks through their fill ports using a telescoping metal rod.

The distance from the top of the fill port to the top of the tank was approximated (± 0.3 feet) by "feeling" either the top of the tank, the space between the fill port pipe and a drop pipe into the tank, or the bottom of the fill port pipe. The bottom of the tank was also sounded and the depth measured on the telescoping metal rod. All measurements were referenced to land surface.

Two different metal locators (White Model 1DB and a Garrett Model ADS-1) were used in the pipe and tank location survey. However, because of the buried depth (usually 3 to 4 feet below ground surface) of the relatively small tank piping (usually about 2 inches in diameter) and the presence of utility piping in the area, there was usually too much ferromagnetic interference to define individual pipelines or even the ends of tanks using the metal locators. Therefore, it was necessary to rely on the internal tank soundings, surface evidence, and "as built" drawings.

The maps of each tank or groups of tanks typically show the tanks to be symmetrical in relation to their fill pipes. In the absence of other data, this is a logical assumption. It is recognized that most of the fill pipes are not in the middle of the tanks but are nearer one end, especially for tanks larger than 5,000 gallons. The orientation was ascertained either from "as-built" drawings or from surface evidence, including position of vent pipes and distances from buildings.

Sumps and clarifiers were also sounded and pertinent features mapped. Sumps and clarifiers are usually covered with steel

hatch plates which were removed to survey the facility. Locations of underground utilities were approximated by noting above-ground appurtenance and patched asphalt, and by the use of "as-built" drawings.

2.3 Data Compilation and Evaluation

Data review work sheets, field notes from the walk-throughs, "as-built" drawings, and waste-water analyses results were compiled and used to generate a computerized data base of information pertinent to all fuel and non-fuel underground storage or holding facilities. The data base was supplemented by the results of the field tank location surveys. The data base information for each tank is included in the Pertinent Construction and Program Data tables in Appendices A and B for Fuel and Non-Fuel Tanks, respectively.

To develop the Phase II Program Plan, the compiled data and the RWQCB's Guidelines were reviewed along with the Sher Bill (AB 1362) and Ordinance No. 83-0206U of the Los Angeles County Code which relates to the storage of hazardous materials in underground storage tanks. The Phase II Program Plan activities were developed to be responsive to the intent of the guidelines and the regulations.

In particular, the Underground Tank Leak Detection Program Plan addresses either Case II, Priority 1 and 2 Tanks, or Case III, Priority 3 Tanks, according to the system of classification used by the RWQCB to guide the level of investigation and monitoring. That system of classification is discussed in detail in the

RWQCB's "Leak Detection Program Guidelines." Briefly, Priority 1 tanks are those installed before January 1, 1978 and which have, at any time, stored hazardous materials, such as solvents, pesticides, herbicides, known carcinogens or mutagens, cyanides, and phenols. Priority 2 tanks are those not included in Priority 1 but which at any time stored hazardous waste. Priority 3 tanks are those tanks not included in Priorities 1 and 2. Case I is for shallow ground water, less than 40 feet below land surface, and applies to all tanks. Case II is for deep ground water, greater than 40 feet below land surface and applies to Priority 1 and 2 tanks. Case III is for deep ground water and Priority 3 tanks.

With regard to the facilities at Plant B-1, the deep ground-water classifications (Cases II and III) are invoked because the ground water is about 140 to 160 feet below land surface. Further, all of the underground fuel tanks will be Case III and the non-fuel tanks will be either Case II or Case III.

2.4 Agency Approval of Phase I Program Plan

CALAC submitted the Phase I program plan, "Plan for Underground Tank Leak Detection Program for Lockheed-California Company's Plant B-1, Burbank, California," dated October 5, 1984, to the RWQCB on October 22, 1984. The RWQCB reviewed the plan and required amendment of the plan to include the following additional activities and information:

- The proposed boring and vapor monitoring well located near the northwest corner of Tank B-1-H be relocated to the southwest corner of the tank;

- Test soil samples from borings near Tank B-1-ZB for volatile organics (VOA) using gas chromatography;

- Monitor Tank B-1-ZE, a 3-stage clarifier, with one suction lysimeter and one vapor monitoring well instead of two suction lysimeters;

- Establish that Tank B-1-ZL was removed in approximately 1983;

- Place one boring, converted to a suction lysimeter, near the southeast corner of spill containment pit B-1-ZP, and inspect the containment structure to the extent feasible;

- Establish that spill containment pit B-1-ZT is normally empty and inspect the pit as proposed;

- Establish that the past contents of Tank B-1-AD was quench until it was taken out of service in about 1979, and inspect the tank as proposed;

- Install one vapor monitoring well about 4 feet west of Tank B-1-AJ and about 4 feet south of 2-stage clarifier B-1-AK; the purpose of this vapor monitoring well is to supplement two borings and two suction lysimeters planned for the aforementioned facilities;

- Establish that secondary containment B-1-AQ is normally dry and inspect the facility as proposed; and

- Visually inspect the secondary containment around a perchloroethylene degreaser, B-1-AB, in Building 104.

The RWQCB issued written approval of the plan on December 20, 1984.

3.0 PHASE II PROGRAM

Phase II of the Underground Tank Leak Detection Program consisted of field investigations, laboratory analyses, and office analysis including drilling borings, collecting soil samples, and installing vapor monitoring wells and suction lysimeters; analyzing tank contents and soil samples (as appropriate); and developing this document to report the results to the RWQCB. This section describes, in general, the Underground Tank Leak Detection Program Phase II procedures and methodologies; the specific field investigations and laboratory analyses for each tank, clarifier or sump are described in Appendices A and B for fuel and non-fuel tanks, respectively.

3.1 Subsurface Investigation

Drilling for all installations was performed by California Testing Laboratories, Inc. of Long Beach, California under the supervision of Gregg & Associates, Inc. The drilling was accomplished using Models B-80 and B-24 drilling rigs, both manufactured by Mobile Drilling Company. The bulk of the drilling was performed with a truck-mounted Model B-80 using hollow-stem augers. The Model B-24 is a skid-mounted rig used in areas of low vertical clearance or where the space is limited. The B-24 was equipped with solid augers which allowed obtaining only auger-cut soil samples.

To reduce the risk of hitting near-tank, high-voltage electrical lines, sewer lines, water lines, natural gas lines, compressed air lines, and tank piping, all of the boring site locations were probed. Probing was accomplished by drilling a 1- to 1 1/4-inch diameter hole through the concrete or asphalt at the surface using an electric hammer drill. The soil beneath the surface slab was probed by driving either a 5/8-inch diameter or a 7/8-inch diameter steel rod or pipe to depths up to 8 feet. The 8-foot depth is below the top of the tanks and the majority of buried utilities. If an object was struck, the steel probe rod was sometimes connected to a resistivity meter grounded to the fill pipe or to surface appurtenance of buried utilities. A measure of electrical continuity permitted the distinction between metal tanks and pipes from possible rocks and non-metallic debris.

In several cases, the probing allowed a more precise definition of the position of the tank than that in the Program Plan presented to and approved by the RWQCB. This resulted in some minor alterations of the Work Plan and some of the boring locations were shifted slightly. An RWQCB Inspector was present at the site during most of the subsurface investigation at Plant B-1, and the proposed modifications were discussed and approved.

3.1.1 Soil Borings

In general, soil borings were drilled to depths of approximately 40 feet near the non-fuel tanks located outside of buildings where the drilling site could be accessed by the B-80

drilling rig. Borings were drilled for the purpose of obtaining soil samples for laboratory analysis. The borings were often completed as a vapor monitoring well or a suction lysimeter for vadose zone monitoring. The fuel tanks were investigated using methods and installations (such as vapor monitoring wells in 10 to 15-foot borings discussed below) in accordance with requirements for Case III. The approved and the actual locations of the borings and other installations are shown on maps in Appendix A for the fuel tanks and in Appendix B for non-fuel tanks; the soil sampling intervals are indicated in the Pertinent Construction and Program Data tables and Boring Logs, also in Appendices A and B.

As originally proposed, several of the borings at Plant B-1 were to have been slanted to sample beneath the tanks. However, the presence of cobbles beneath the plant, the abundance of underground piping very near the tanks, and the limited access to many tanks precluded use of this method of drilling.

The majority of the soil borings were made with the Model B-80 drilling rig using hollow-stem auger flights in 5-foot segments. The auger flights have an inside diameter of approximately 3.5 inches and an outside diameter of approximately 8 inches. A wireline was used to position the sampling device to obtain undisturbed soil samples. The sampler, a penetration or drive sampler, was driven below the auger flights by the force of a 140-pound falling weight.

The penetration or drive sampler consists of an outer barrel and an inner set of rings or liners. The stainless steel outer barrel is about 3.200 inches outside diameter and 2.500 inches inside diameter. Brass inner rings or liners are 2.500 inches outside diameter and 2.375 inches inside diameter, and are in 3-inch and 6-inch lengths. The bottom of the sampler was equipped with a "sand retainer" ring which minimized the loss of dry granular material from the sampler when it was retrieved from the borehole.

In each boring, relatively undisturbed soil samples were to have been collected at depths of approximately midpoint to the nearest tank, and at approximately 5, 10, 20, and 30 feet below the bottom of the tank. The presence of cobbles often dictated that minor alterations in the sampling depths be made. The actual sample depths for each boring are shown on the Pertinent Construction and Program Data table in Appendices A and B for each tank. It should be noted that minor differences in reported sampling depths on lithologic logs, in chemical tables, and in the Pertinent Construction and Program Data tables may exist. This is due to slight variations in interpretations of exactly where soil samples were collected and to the rounding off of fractional units of a foot of depth. These minor variations are not pertinent to the overall results for any boring or tank.

The soil samples were collected using the penetration sampler with two (an upper and a lower), 3-inch inner rings and a middle 6-inch inner ring. Immediately upon bringing the soil sampler

containing the sample to the surface, the outer barrel of the sampler was opened and the three ring segments removed. The middle, 6-inch inner ring was quickly sealed at both ends with aluminum foil secured by duct tape and placed in an ice chest containing frozen "blue ice" in accordance to U.S Environmental Protection Agency guidelines for preserving and storing samples for shipment to a chemical laboratory. The soil samples in the 3-inch rings were placed in jars or in zip-lock plastic bags, sealed, labeled, and kept at ambient temperature. One 3-inch, ring sample was used for field testing; the other sample was used for lithologic examination and description.

In boreholes adjacent to tanks where volatile organics are stored, the soil cuttings were "sniffed" with a Photoionizer Detector (HNU PID). Samples in the 3-inch ring liners were also "sniffed." After all of the depth-specific samples were collected for each boring, the lids of the jars or the plastic bags were opened slightly, the HNU PID probe inserted into the container, and the vapors in the head space "sniffed." The HNU PID readings are in parts per million equivalent to a propane calibration standard. This method is not precise and was used only as a semi-quantitative indicator. It was, however, very useful in on-site assessment when there were indications of subsurface contamination. When contamination was indicated, some modification of the laboratory program was made to maximize its efficiency.

To minimize the possibility of cross-contamination of samples and the walls of the borehole, the inside and outside of the auger flights, the end plug, and the back of the auger rig were steam cleaned after drilling a boring where contamination was found. Between successive samples in the same hole, the penetration sampler and the inner rings were scrubbed with soap and water, rinsed with tap water, dipped in commercial-grade hexane, rinsed with distilled water, and then air dried. The sampler and the inner rings were handled only by persons wearing disposable gloves.

At the completion of sampling each boring, the borehole was allowed to cave as the augers were retracted and/or filled from bottom to top with a dry mixture of clean sand and bentonite to plug the open borehole with a relatively impervious material. The asphalt or concrete surfacing material was patched to restore the site. A typical plugged borehole is shown in Figure 2.

3.1.2 Vapor Monitoring Wells

The locations of both the approved and the actual vapor monitoring wells are shown on individual tank maps in Appendices A and B, and the completed wells are described in the Pertinent Construction and Program Data tables and the Boring Logs for each installation. In general, vapor monitoring wells were installed as permanent installations in or very near backfill material adjacent to underground tanks and to at least the depth of the backfill. During the auger boring for the vapor monitoring wells, soil samples were collected using the same techniques

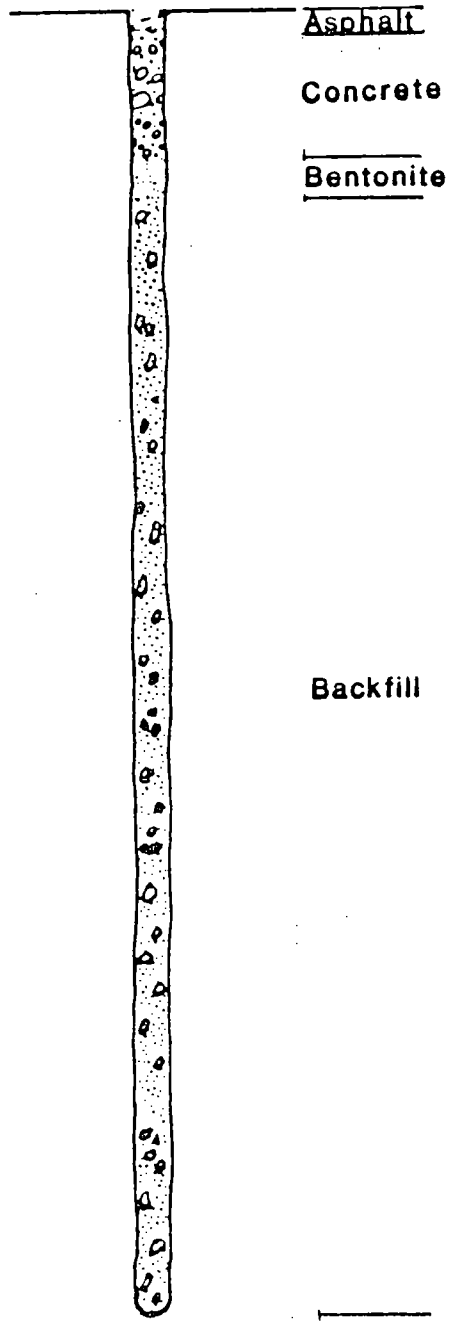


FIGURE 2

TYPICAL BORING ABANDONMENT AND PLUGGING

described in Section 3.1.1. The soil samples were submitted to the laboratory for analysis for the appropriate parameters.

The design of a typical vapor monitoring well is shown in Figure 3. The vapor monitoring wells were constructed of 2-inch inside diameter (ID), Schedule 40, polyvinyl chloride (PVC) pipe. The bottom portion of the wells was equipped with factory slotted screen (0.020-inch slots), and the upper 5 to 8 feet were of blank pipe. The casing was terminated about 3 inches below grade. All vapor monitoring well joints were slip couplings secured with pop rivets or screws. No glued joints were used. A Cristy meter box protects the monitoring well installation at the surface.

The 2-inch ID vapor monitoring wells were placed to the bottom of the borehole inside the hollow-stem auger flights. Typically, a sand pack, composed of clean and bagged Number 2 Monterey Sand, was placed opposite and extending about one foot above the screened section. The borehole above the sand pack was sealed with a layer of bentonite, usually 1 to 2 feet thick to near land surface. Later a crew installed a Christy meter box with a cast iron cover to protect the vapor monitoring well. The upper 18 to 24 inches of bentonite and the surrounding soil were removed, and the box placed into the borehole and cemented in place. The cement was placed above the remaining bentonite plug in the annulus between the sides of the hole and the blank PVC monitoring well casing. The cement extended around the Christy meter box and up into the lower 4 to 6 inches of the box.

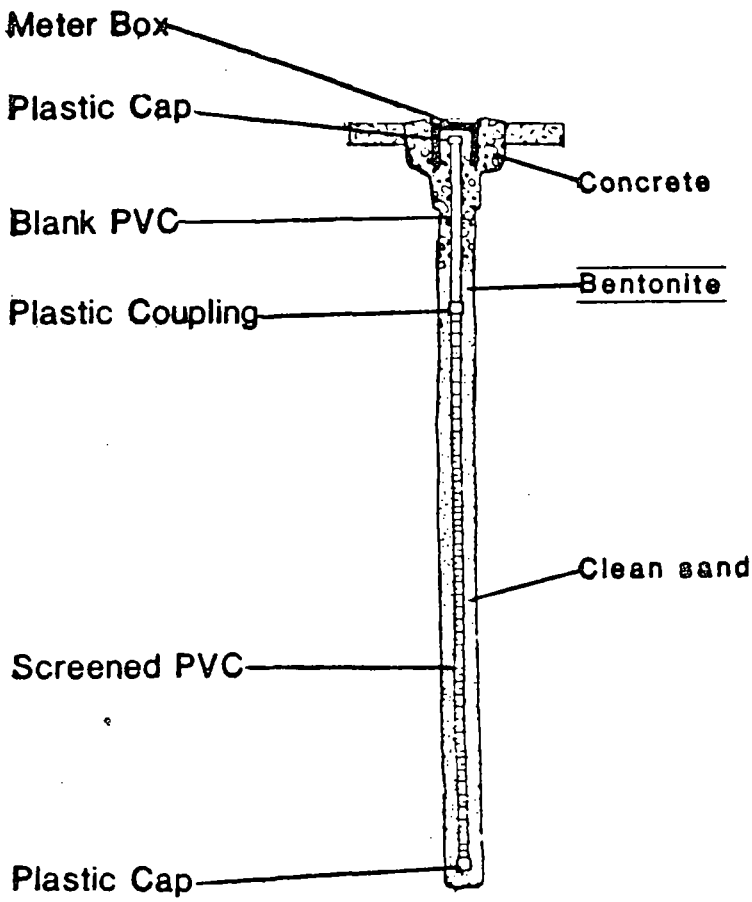


FIGURE 3

TYPICAL VAPOR MONITORING WELL INSTALLATION

Precautions were taken to prevent contamination of monitoring wells and equipment. All PVC well screens, blank pipe, and fittings were cleansed in an aqueous trisodium phosphate solution and flushed with distilled water before installation in the boring. All sand placed in the well was bagged material. Workers handling the PVC casing and screen assembly wore disposable gloves. With these precautions, it is unlikely that contamination of the monitoring facilities occurred during the installation.

3.1.3 Suction Lysimeters

Suction lysimeters were installed in lieu of vapor monitoring wells to monitor the presence of fluids in the backfill materials around selected non-fuel tanks. A suction lysimeter was installed if the fluid in the tank (or sump or clarifier) was not a volatile organic material and, therefore, would not be detectable in vapor. Typically, dilute waste water or rinse water from metal cleaning operations would not have any significant volatile organics. The tank location maps in Appendix B show the approved and the actual locations for placement of individual lysimeters, and the Pertinent Construction and Program Data table and Boring Log for each tank describes the construction depths of the suction lysimeters and sample analysis parameters.

A typical suction lysimeter, shown in Figure 4, consists of a porous ceramic cup, about 1.5 inches in diameter, connected to a holding reservoir of PVC, and connected to land surface by two small-diameter PVC tubes. One tube is used for applying a vacuum

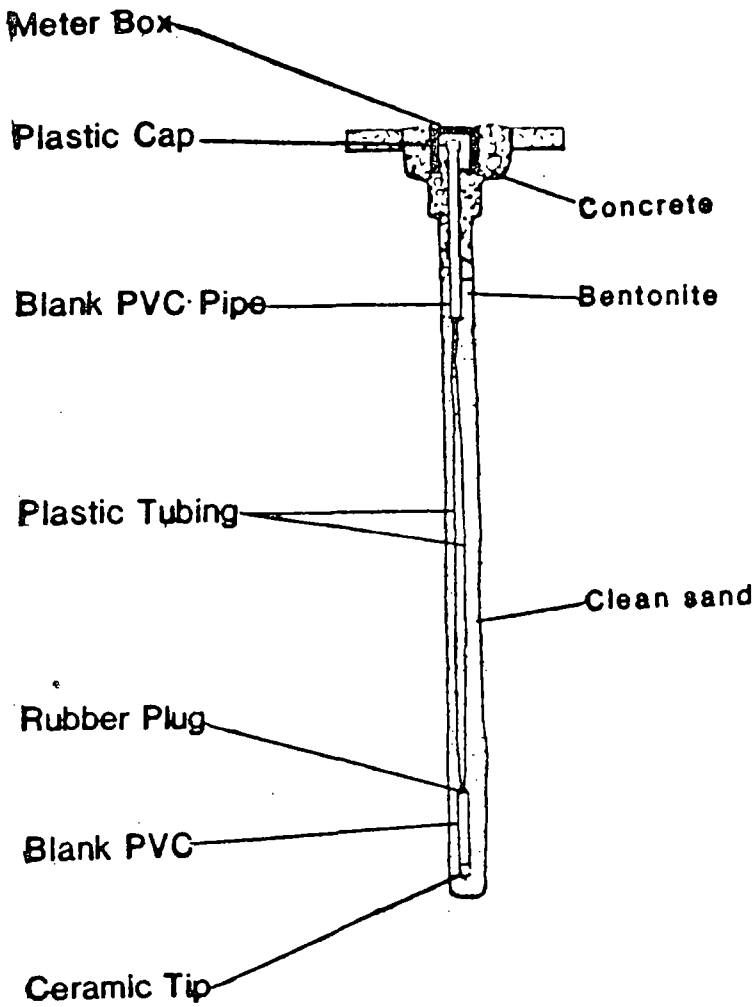


FIGURE 4

TYPICAL SUCTION LYSIMETER INSTALLATION

to the system to entice pore water from the soil to migrate through the porous ceramic cup and into the holding reservoir. After a period of up to several hours, the vacuum is removed and the tube is pressurized, which forces the stored water through the second tube to the surface where the fluid is collected for analysis. Lysimeters usually are most efficient when the soils are fine-grained (but not clays) and have a moisture content near their field capacity. Although the soils at Plant B-1 were not ideal for using suction lysimeters, there would be sufficient moisture in the soil to collect a sample using the suction lysimeter in case of a leak.

In a typical installation, the borehole was drilled about one foot below the desired suction lysimeter depth. A mixture of natural sand from the borehole and clean silica sand was prepared. The natural material was sieved to remove pebbles and rocks. The mixture was poured into the borehole to the monitoring level. The lysimeter was lowered into the borehole and more sand mixture was poured around the lysimeter; this was also accompanied by adding a small amount of distilled water to the mixture to ensure both settling of the sand and grain-to-grain contact of the materials about the porous cup. This mix extended several feet above the lysimeter. Clean sand was added until the level reached approximately 5 feet below ground surface. The upper end of the lysimeter and the suction and return lines were encased in a 5-foot length of 2-inch ID PVC pipe. This pipe aided in the placement of the instrument and sand fill and protected the installation. A bentonite seal, at

TABLE 1 - ANALYTICAL PARAMETERS AND METHODS OF ANALYSIS OF SAMPLES FROM PLANT B-1 (Continued)

Tank Contents	Parameters	Analytical Methods*	EPA Number**
Sodium Dichromate	Cr	AA	218.1
	Na	AA	273.1
	pH	Electrode	9040,9050
Sodium Cyanide	Na	AA	273.1
	CN	Titrimetric	353.3
Dillute Sodium Hydroxide	CAM Metals***	AA and ICP	200 Series,6010
	Hydrocarbons	IR	418.1
	Volatile Organics	GC	8010,8020

* AA, Atomic Adsorption; ICP, Inductively Coupled Optical Emission Spectroscopy; GC, Gas Chromatography; IR, Infrared.

** EPA Number, From "Test Methods for Evaluating Solid Waste", EPA Report, SW-846; and From "Technical Manual for Inorganic Sampling and Analysis", EPA Report, EPA 600/2-77-024.

*** CAM, California Assessment Manual, 1981, California Department of Health Services.

least one foot thick, was placed on top of the sand filling and the remainder of the annulus was filled with concrete. The suction lysimeter installation was protected by a Christy meter box at the surface.

3.2 Laboratory Analyses

3.2.1 Tank Contents

Laboratory analyses of selected tank contents were made if the contents of the tanks were uncertain. The laboratory testing of tank contents varied according to the purpose of the tank and the process it supported. In general, samples of fluids from non-fuel tanks, sumps, and clarifiers were analyzed for one or more for the following parameters or groups of parameters: 17 trace metals listed in the California Assessment Manual (CAM) used by the California Department of Health Services, pH, and recoverable hydrocarbons and/or volatile organics. Usually the tank contents were analyzed for the parameters listed in and using the methods identified in Table 1. Although the contents of selected tanks were sampled before drilling began, the analytical results were not always available in time to aid in selecting or focusing on fewer and more pertinent parameters. In such cases it was necessary to conduct a more elaborate and extensive analytical program.

With the exception of a small number of samples from three boreholes which were analyzed by Truesdail Laboratories, Inc., Tustin, CA, the analytical testing was done by Analytical Technologies, Inc., National City, CA. Both companies are

TABLE 1 - ANALYTICAL PARAMETERS AND METHODS OF ANALYSIS OF SAMPLES FROM PLANT B-1

Tank Contents	Parameters	Analytical Methods*	EPA Number**
Diesel #2 Heating Oil	Hydrocarbons	IR	418.1
	Volatile Organics	GC	8010,8020
Water Soluble Oil Coolant	Hydrocarbons	IR	418.1
	Volatile Organics	GC	8010,8020
Hydraulic Oil	Hydrocarbons	IR	418.1
	Volatile Organics	GC	8010,8020
Cutting Oils	Hydrocarbons	IR	418.1
	Volatile Organics	GC	8010,1820
Chemical Processing rinses	CAM Metals***	AA and ICP	200 Series,6010
	Volatile Organics	GC	8010,8020
	CN	Titrimetric	353.3
	pH	Electrode	9040,9050
Metal Cleaning Rinse Water	CAM Metals***	AA and ICP	200 Series,6010
	Cr	AA	218.1
	pH	Electrode	9040,9050
Deburring Cleaners	CAM Metals***	AA and ICP	200 Series,6010
	Hydrocarbons	IR	418.1
	Volatile Organics	GC	8010,8020
	pH	Electrode	9040,9050
Detergents/ Surfactants	Volatile Organics	GC	8010,8020
	SO4	Colorimetric	375.2
Paint Residues	CAM Metals***	AA and ICP	200 Series,6010
	Volatile Organics	GC	8010,8020
	pH	Electrode	9040,9050
Tetrachloroethene	Volatile Organics	GC	8010,8020
Hydrochloric Acid	Cl	Calorimetric	375.1
	pH	Electrode	9040,9050
Chromic Acid and Sulfuric Acid	CAM Metals***	AA and ICP	200 Series,6010
	Volatile Organics	GC	8010,8020
	Cr	AA	218.1
	SO4	Colorimetric	375.2
	pH	Electrode	9040,9050

TABLE 1C: SUMMARY OF WORK ACTIVITIES AND FIDINGS FOR SELECTED UNDERGROUND STORAGE FACILITIES, PLANT B-1

STORAGE FACILITY NO.	FACILITY TYPE AND CONTENTS	WORK ACTIVITIES PLANNED	WORK ACTIVITIES PERFORMED	DATE PERFORMED	SUMMARY OF FINDINGS
B-1-C	Tank - rinse water	Tank integrity test	Tank integrity test	05/31/85	Tank "certified tight". Vapor well to be monitored.
B-1-J*	Sump - waste oil	Clean and inspect	Cleaned and inspected	05/06/85	Sump not leaking.
B-1-ZB*	Clarifier	Clean and inspect	Cleaned and inspected, Drilled one boring	05/06/85 06/11/85	Clarifier leaking; unused, to be abandoned; high contamination.
B-1-ZI*	Clarifier	Sample contents drill one boring	Sampled clarifier contents, Drilled one boring	05/09/85 05/17/85	Clarifier not leaking, low contamination.
B-1-AI	Clarifier - steam clean waste	Clean and inspect	Cleaned and inspected	05/22/85	Inflow and outflow pipes leak; Surface spillage.
B-1-AK	Clarifier	Clean and inspect**	Cleaned and inspected	05/22/85	Clarifier not leaking
B-1-AM*	Sump - waste oil	Clean and inspect	Cleaned and inspected	05/06/85	Sump not leaking - contamination due to overflow
B-1-AW	Sump - waste oil	Clean and inspect** drill one boring**	Cleaned and inspected, Drilled/installed vapor monitoring well	05/06/85 05/06/85	Sump not leaking, no contamination
B-1-F14	Tank - fuel	Abandon in place**	None		Unused, to be abandoned in place.

*Tanks requiring investigative activities (preliminary report May 22, 1985 to RWQCB)
** CALAC requested work

certified by the State of California and are recognized as qualified by the RWQCB. The work was divided according to cost and quality assurance considerations.

3.2.2 Soil Samples

The capped soil sample tubes were contained in a shipping ice chest cooled with frozen "blue ice," and were accompanied by a Chain-of-Custody manifest and specific instructions. The soil samples were delivered to the laboratories via courier. Detailed procedures for Chain-of-Custody and Quality Assurance/Quality Control (QA/QC) were developed in accordance to recognized EPA and California Department of Health Services recommended practice. Similarly, the laboratory programs were subject to a stringent QA/QC program. Adherence to that program was monitored by a representative of Gregg & Associates, Inc.

As stated earlier, during the collection of the soil samples in the field, those samples suspected of containing volatile organics were "sniffed" using the HNU PID. With regard to analysis, the laboratory program proposed in the Work Plan was altered, based on field observations, to be more responsive to conditions. The actual laboratory programs for each facility are described in Appendices A and B. Indications of contamination in a boring in the field usually dictated that the samples from that boring were not composited but were analyzed on a depth-specific basis, including the sample collected at the midpoint of the tank. The one sample collected from each of the boreholes for either the vapor monitoring wells or the suction lysimeter

boreholes was analyzed as a discrete sample. In addition, background soil samples were collected from areas not subject to contamination. The results of the analysis of those background samples were used for comparison with the results of analytical work on soil samples from the areas of tanks.

3.3 Tank Investigative Activities

3.3.1 Tank Integrity Test

A tank integrity test consists of precisely monitoring the fluid level and the tank temperature for a period of several hours. The fluid level data are adjusted for temperature drifts to determine if there is a fluid leak. Tank Integrity Tests for specific underground tanks which had possible leaks were performed by Horner Creative Metals, Inc. of Kawlawlin, Michigan. The test was accomplished using hydrostatic equipment which can detect leaks in tanks and related piping systems with a level of detection of ± 0.05 gallons per hour. This is the approved level of detection required by the National Fire Protection Authority (NFPA) #329. The test involves forcing a small trickle of air into the top 1/2 inch of the product and measuring the pressure required to maintain a continuous flow of bubbles. This pressure is recorded on a circular chart. The system is capable of recording liquid level changes of 1/100-inch. Because temperature variations can change product level drastically, minute temperature fluctuations (to 0.001 degrees F) are recorded. The temperature is measured throughout the cross-section of the tank to eliminate temperature stratification differences. The recorded change in volume of liquid in the tank was adjusted for the change in volume caused by temperature variations. The results of these tests are located in Appendix C.

During some of the tank integrity tests some of the tanks could not hold the product above the top of the tank, which suggested a leak or leaks in the piping system. Because of the possibility of leaks in the piping system, CALAC contracted a company to uncover, pressure test, and repair all leaks in the pipes. The product and vent lines were then pressure tested with compressed nitrogen.

3.3.2 Clarifier or Sump Inspections

The inspection of clarifiers or sumps consists of visually determining if there has been erosion or corrosion of the concrete or metal strorage structures, or if there are apparent cracks or holes which may form a conduit for fluids to leak. As part of the inspection, the clarifiers or sumps are vacuum pumped and as necessary the sides and bottoms are high-pressure steam cleaned using detergents or trisodium phosphate solutions and clean water As necessary, facility surfaces are brushed or scraped. The effluent from the cleaning operations are either removed by the vacuum truck or transferred to drums. The drums and contents are either eventually picked up by a waste hauler or the contents transferred back to the sump or clarifier after the inspection.

Following cleaning/scraping, the walls and bottom of the storage facility are probed to evaluate degradation of the material. If erosion, corrosion, cracks or holes are apparent, the location and severity are recorded. Inspection diagrams accompany the inspection summary for each sump or clarifier.

4.0 FINDINGS

The Underground Leak Detection Program investigated a total of 52 underground liquid storage or short-term holding facilities at CALAC's Plant B-1. Of the 52 underground facilities, 6 are fuel tanks and 46 are non-fuel facilities consisting of 15 sumps, 24 clarifiers and 7 tanks. All six fuel tanks contain diesel fuel for boilers. All of the pertinent construction and program data for each tank are summarized in Appendix A - Fuel Tanks and Appendix B - Non-Fuel Tanks.

4.1 Lithologic Characterization

Soil samples were collected from test borings drilled to about 40 feet on Plant B-1 near tanks, clarifiers, and sumps. The soil was quite uniform throughout the site and typically consisted of medium- to coarse-grained sand with occasional cobbles. In addition, there are some layers of disseminated fine sand, very coarse sand, pebbles and gravel. As those sizes of particles are usually a minor percentage of the sample, they commonly are not mentioned in the lithologic description. In addition, the soils are not distinctly stratified and lateral variations in grain size prohibit detailed correlation of strata between borings. Also, although the cobbles appear to be a minor percentage of the total soil mass, when found they dominated the sample and interfered with the drilling and drive sampling. As a result, the cobbles are specified in the drilling logs.

Of particular importance to this investigation is that the sand is pervious and clean, containing very small amounts of clay, silt, and organic matter. The presence of clay, silt, and organic matter would be favorable for rapidly attenuating contaminants. Fortunately, the unsaturated thickness of the sand is greater than 140 feet. That thickness of even a clean sand will be quite effective in attenuating appreciable quantities of all but the most mobile of contaminants.

4.2 Field Boring Observations

Many important observations were made during the drilling of test borings and boreholes for suction lysimeters and vapor monitoring wells. The lithology was identified from auger flight cuttings and from penetration samples. In some cases or at some boring intervals, the abundance of cobbles prevented recovery of soil samples but the bouncing and vibrating action of the auger bit against the cobbles was an excellant indication of their presence.

The number of blows to attempt to drive a sampler 12 inches is recorded on the lithologic logs. If 50 blows were reached and the sampler had not been driven the full 12 inches, then the driving was terminated and it was recorded that 50+ blows were required. It was found that the samplers commonly had been driven 8 or 10 inches and that the inner liners contained sufficient quantity of soil for chemical analyses. Further, no attempt was made to maintain a precise, 30-inch hammer fall distance. Thus, the use of the blow count data for geotechnical design purposes is not encouraged.

The soil samples from the auger flights and those from the 3-inch-long rings not sent to the laboratory were closely inspected for moisture, color changes and consistency as well as odors. If the soil was contaminated by inorganic fluids, such as dilute wash water from a clarifier or a sump, the soils would be more moist than uncontaminated soils, and would usually exhibit some discoloration.

The presence of organic chemical contamination in soil samples was usually quite apparent. As the principal indicator for hydrocarbons (fuels) and volatile organic contamination was odor, these contaminants were normally first detected by smell. The HNU-PID was used to semiquantify the vapor venting from the soil. The HNU-PID was also used to monitor the breathing zone as a safety precaution. If the HNU-PID indicated levels of volatile organics nearing critical levels, respirators were worn to protect personnel. High hydrocarbon and volatile organic concentrations sometimes could also be correlated to discoloration (from brown to dark brown) of the soil. Thus, the appearance and the odor of the soil found during drilling were important observations of possible contamination. Table 2 lists three fuel tanks and eight non-fuel facilities where there were indications of possible contamination in soil borings.

4.3 Results of Chemical Analyses

Soil samples were collected and analyzed for the principal chemicals that either are currently or have historically been contained in the nearby tank, clarifier, or sump under

TABLE 2 - TANKS WHERE POSSIBLE INDICATIONS OF SOIL CONTAMINATION WERE NOTED DURING DRILLING

Tank Number	Observations
Fuel Tanks	
B-1-F1	Slight Odor
B-1-F2	Slight Odor
B-1-F14	Strong Diesel Odor
Non-Fuel Tanks	
B-1-J	Strong Odor
B-1-ZB	Strong Tetrachloroethene Odor
B-1-ZG	Slight Odor
B-1-ZP	Slight Odor
B-1-ZY	Slight Sewage Odor
B-1-AJ	Slight Odor
B-1-AK	Slight Odor
B-1-AM	Strong Oil Odor
B-1-AU	Slight Odor
B-1-AW	Slight Odor

investigation. If field observations indicated the possible presence of chemical contaminants (i.e., volatile organics) that have not been included in the historical contents records, then the suspected contaminant was also included in the analysis.

The results of the chemical analyses of selected fuel and non-fuel facilities contents and the associated soil samples are presented in Appendices A and B. The majority of the depth-specific soil samples were composited for analyses. If an indication of possible soil contamination was noted during drilling or if the tank (or clarifier, or sump) contained chemicals that might not be detected in the field, then depth-specific samples were analyzed.

Typically, soil samples were collected at a midtank depth and at depths of about 5, 10, 20, and 30 feet below the tank. The presence of cobbles may have dictated a minor change in the sampling intervals. The maximum bore depth was always about 40 feet below the surface. The soil sample taken at the midtank depth was usually not analyzed by the laboratory but was held in cold storage for possible future analysis if contamination was found in the samples below the tank. As it is not uncommon in tank investigations to find that the major source of contamination is from the surface and not from a leaking tank, the midtank soil sample is useful in distinguishing surface sources from tank leakage. If contamination was indicated below the tank, then the soil sample at midtank depth would be available for analysis.

One background soil boring was drilled at Plant B-1 and the soil samples were analyzed for pH, CAM metals, hydrocarbons, volatile organics, sodium, sulfate and cyanide. The location of the background boring is shown on Figure 5 and a lithologic log of the boring is shown on Figure 6. The analytical results for soils taken from the background boring and the background values used in this report to assess levels of contamination are shown in Table 3. It should be noted that several of the soil samples taken for various tanks were analyzed for organic solvents which were not included in the volatile organic analysis conducted on the background sample. These organic solvents are marked N.T. (not tested) in the column indicating background levels on the chemical analyses tables for each facility in Appendices A and B. The values for these solvents, however, can be assumed to be zero for the purpose of identifying potentially high concentrations. These particular organic solvents were not tested in the background sample because they are not priority pollutants.

The background values used in this report to establish the presence of contamination are an average of the values determined for that contaminant in laboratory testing of the background boring's depth-specific samples. Tables comparing the results of the analyses on the soil samples taken near each tank with the background value for each parameter selected can be found in Appendices A and B.

TABLE 3: RESULTS OF CHEMICAL ANALYSES FOR B-1 BACKGROUND SAMPLES

PARAMETER	B-1 BACKGROUND AVERAGE CONCENTRATION	TTLC	B-1 BACKGROUND 10 ft.	B-1 BACKGROUND 20 ft.	B-1 BACKGROUND 30 ft.	B-1 BACKGROUND 40 ft.
Volatile Organics (ug/kg)		N.A.	N.D.	N.D.	N.D.	N.D.
Benzene	<0.2					
Ethyl Benzene	<0.1					
Chloroform	<0.1					
Chloromethane	<0.2					
Chloroethane	<0.8					
1,1-Dichloroethane	<0.1					
1,2-Dichloroethane	<0.1					
1,2-Dichloropropane	<0.1					
1,1,1-Trichlorethane	<0.2					
1,1,2-Trichloroethane	<0.1					
Bromodichloromethane	<0.1					
Dibromochloromethane	<0.1					
1,1-Dichloroethene	<0.1					
trans-1,2-Dichloroethene	<0.1					
Trichloroethene	<0.3	± 2,040				
Tetrachloroethene	<0.4					
Toluene	<0.4					
Methyl Ethyl Ketone	<0.5					
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	2.7	<2.0	<2.0	<2.0
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.	N.T.
CAM Metals (mg/kg)						
Antimony	<2.5	500	<2.5	<2.5	<2.5	<2.5
Arsenic	13.4	500	7.76	12.3	19.6	13.8
Barium	91.9	10,000	36.4	91.9	164	75.1
Beryllium	<1.0	75	<1.0	<1.0	<1.0	<1.0
Cadmium	<2.5	100	<2.5	<2.5	<2.5	<2.5
Chromium (Total)	9.6	2,500	5.3	5.3	21.8	5.9
Cobalt	6.5	8,000	2.9	4.1	14.0	4.8
Copper	22.1	250	42.4	10.7	26.6	8.5
Lead	<2.5	1,000	<2.5	<2.5	3.42	<2.5
Mercury	<0.1	20	<0.1	<0.1	<0.1	<0.1
Molybdenum	6.3	3,500	3.4	4.2	12.4	5.2
Nickel	8.4	2,000	4.4	5.4	18.5	5.3
Selenium	<2.5	100	<2.5	<2.5	<2.5	<2.5
Silver	<2.5	500	<2.5	<2.5	<2.5	<2.5
Thallium	<2.5	700	<2.5	<2.5	<2.5	<2.5
Vanadium	22.0	2,400	9.6	14.3	47.4	16.7
Zinc	38.7	2,500	35.5	25.5	65.9	27.9
Others						
pH (standard units)	8.24	N.A.	8.61	8.22	7.77	8.37
Sodium (mg/kg)	403	N.A.	284	387	687	253
Cyanide (mg/kg)	<0.2	N.A.	<0.2	<0.2	<0.2	<0.2
Sulfate (mg/kg)	<6	N.A.	<6	<6	<6	<6

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

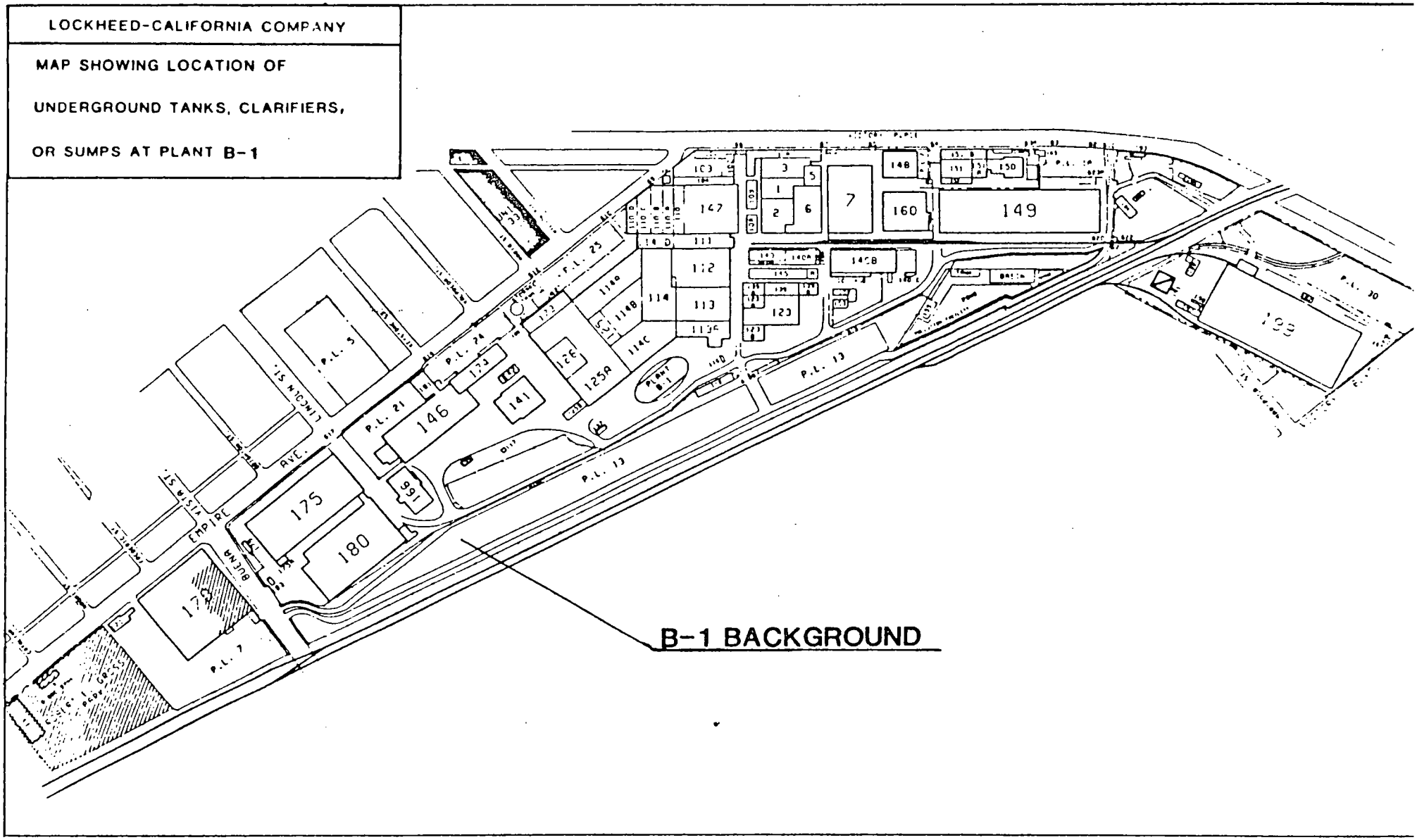
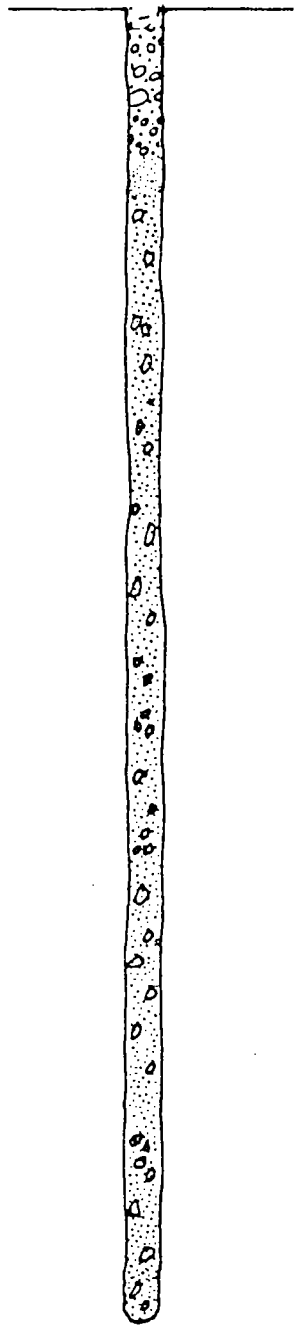


FIGURE 5 – LOCATION OF BACKGROUND SOIL BORING

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			-Asphalt -Sand,fine to coarse grain,brown,w/gravel
	- 2 -			
	- 4 -			
	- 6 -			
	- 8 -			
	- 10 -		50+	
	- 12 -			
	- 14 -			
	- 16 -			
	- 18 -			
	- 20 -		50+	-Sand,fine to coarse grain,brown,
	- 22 -			
	- 24 -			
	- 26 -			
	- 28 -			
	- 30 -		50+	-Sand,fine to medium grain,w/clay & silt, dark brown,cohesive, moist
	- 32 -			
	- 34 -			
	- 36 -			
	- 38 -			-Sand,fine to coarse grain,brown,w/some gravel
	- 40 -		50+	

0837

COMPLETION & BACKFILL

-Asphalt, 0-0.5 ft
-Concrete, 0.5-4 ft
-Bentonite, 4-5 ft
-Native material, backfill 5-40 ft

TANK NO. B-1 BACKGROUND

BORING NO. B-1 BACKGROUND

GREGG & ASSOCIATES, INC.

FIGURE 6 - LITHOLOGIC LOG FOR B-1 BACKGROUND

It should be noted that the limits of detection of certain constituents differed in some samples from the limits observed in the background analysis. This is due primarily to variations in instrument capabilities and standard ~~solutions~~ dilutions, and analytical practices between the laboratories conducting the tests. These observed differences in levels of detection between the laboratories, however, are extremely small in relation to the Total Threshold Limit Concentration (TTLC) established by the California Department of Health Services.

For this investigation in general and considering the accuracy of laboratory testing, if analyses of soil samples collected near tanks indicated concentrations of chemical parameters which exceeded the background concentrations, then the soil was considered to be contaminated. There are, however, exceptions to this general rule. For example, petroleum hydrocarbon concentrations in background samples were typically less than 2 milligrams per kilogram (mg/kg), yet it was not uncommon for soil samples near tanks to have concentrations of 2 to 5 mg/kg petroleum hydrocarbons. However, it is questionable whether this constitutes contamination. A soil sample in which the petroleum hydrocarbons concentration was found to exceed 6 to 8 mg/kg would definitely be considered contaminated. Also, in general, in interpreting these data, if concentrations were under about 30 mg/kg in soil samples from the upper 15 feet, it was judged that the source is likely surface spills, overflowing fill pipes, and activities unrelated to tank integrity.

As stated earlier, a comparison of laboratory analysis results of soil samples collected near the tanks was made with the average background values established from the background boring samples. This comparison indicated when depth-specific or composite soil samples collected near the tanks had one or more constituents which appreciably exceeded the concentrations of the same constituents reported for the background samples. Laboratory analyses of soil samples from borings or boreholes near 1 fuel tank and 19 non-fuel tanks (or clarifiers or sumps) indicated possible soil contamination. Those tanks and the chemical constituents exhibiting elevated concentrations are shown on Table 4.

4.4 Summary of Field and Laboratory Findings

This section discusses those tanks where significant contamination or unusual findings warranted explanation. The results of this program for all tanks are discussed in Appendices A and B for fuel tanks and non-fuel tanks, respectively. As stated above, possible contamination was noted during drilling at three fuel tanks and eight non-fuel tanks. Laboratory analyses of soil samples from borings or boreholes near 1 fuel tank and 19 non-fuel tanks (or clarifiers or sumps) indicated possible soil contamination. Tables 2 and 4 list, respectively, those facilities where soil contamination was observed during drilling and/or found through laboratory analyses of the soil samples.

Tank B-1-F14 - Laboratory analyses of the soil sample from the 12-foot depth, 2 feet below the 10-foot-depth bottom of the tank, in the boring for Vapor Monitoring Well B-1-F14-MV1 near Tank B-1-F14 showed a high concentration (130 mg/kg) of petroleum hydrocarbons. Petroleum hydrocarbons, however, were not detected in the laboratory analyses for samples collected from the 25- and 40-foot depths of the same well. In addition, a strong diesel odor was noted during drilling.

Vapor Monitoring Well B-1-F14-MV1 was installed near the southwest corner of Tank B-1-F14 alongside a water line on the west side of the tank. It was noted in the drilling report that there was a color change from dark brown to gray from about 8 to 10 feet, and there was a strong petroliferous odor. The odor was reported to about 25 feet where a color change back to brown was noted. The odor was slight below this depth. A low level of petroleum hydrocarbons (16 mg/kg) was reported for Well B-1-F14-MV2. No odor was noted in the drilling report for Well B-1-F14-MV2.

Based on the fact that the high level of petroleum hydrocarbons was found at a depth below the tank bottom, it is concluded that Tank B-1-F14 is probably leaking. It is recommended that a tank integrity test be conducted. Depending upon the results of that test, additional drilling and sampling may be necessary to determine the source and extent of soil contamination.

Tank B-1-C - Soil samples collected near the southwest corner of Tank B-1-C at Boring B-1-C-B1 were composited and analyzed in the laboratory for volatile organics, petroleum hydrocarbons, CAM metals, and pH. Although there were no indications of contamination noted during the field program, the volatile organic analysis showed a high concentration (295 ug/kg) of acetone.

Tank B-1-C is used for tool cleaning. The 5000-gallon tank contains dilute sodium hydroxide (NaOH). Existing records indicate that no other chemicals have been contained in the tank. In addition, a higher pH than that reported for the composite sample (8.07) would be expected if NaOH was leaking into the soil.

Based on these observations and laboratory results, it is concluded that it is unlikely that Tank B-1-C is leaking. A tank integrity test should be run and additional sampling and analysis will be required to determine the source of the high concentration of acetone found in the composite soil sample.

Sump B-1-J - Sump B-1-J presently contains, and has historically contained, waste oil. Laboratory analyses of the liquid sample collected from Sump B-1-J indicate that the liquid is greater than 99 percent petroleum hydrocarbons (oil). The surface area around the sump was stained and reportedly has been covered with oil, suggesting that the sump has overflowed in the past.

The 20.5-foot soil sample was found to contain only 5 mg/kg petroleum hydrocarbons. High levels of hydrocarbons were reported for the soil samples collected at 5.5, 10.5, 15.5, 30.5, and 40.5 feet. The laboratory analysis of soil samples also showed moderate to high concentrations of arsenic, barium, chromium, cobalt, nickel, vanadium, and zinc. The CAM metals were analyzed because small globs of yellow material, thought to be zinc chromate paint sludge, were found in the soil samples.

The drilling report indicates that the soil at Boring B-1-J-B1 was a medium-grain, dark gray sand with a strong odor to about 10 feet, where a color change and decreasing odor was noted. The grain size between 30 and 40 feet was reported to be fine to very fine sand.

Laboratory and field observations indicate that the soils around Sump B-1-J have been contaminated with volatile organic compounds, petroleum hydrocarbons, and several metals. There are several possible sources for the contamination including sump leakage, overflow, surface spills and migrating contaminants from the adjacent construction waste disposal site. Because of uncertainty regarding the actual source of contamination, it is concluded that Sump B-1-J may possibly be leaking. Additional sampling and analysis is required to determine the source. Further, the sump should be cleaned and inspected for possible cracks.

Clarifier B-1-ZB - A strong tetrachloroethene odor was noted at a depth of about 32 feet during drilling at Boring B-1-ZB-B1, north

of Clarifier B-1-ZB. Above this depth, the odor was reported to be only slight and there was no report of any anomalous color change. The laboratory analyses indicate that the only volatile organic compound detected in the individual depth samples collected from Boring B-1-ZB-B1 was tetrachloroethene. This compound was present in each of the samples at concentrations ranging from 4.9 to 61.0 ug/kg for the 5.5-, 10.5-, 15.5-, and 25.5-foot samples, and 301,000 ug/kg (301 mg/kg) for the sample collected at 40.5 feet.

Clarifier B-1-ZB is a two-stage, 3000-gallon, metal-cleaning rinse clarifier and contains dilute sulfuric acid and sodium dichromate. No high chromium concentrations were determined in the composite soil sample. However, a moderate level was found in the 10.5 foot individual - depth sample. Although the liquid contained in the clarifier presently contains no tetrachloroethene, it has received on occasion inflows of the compound from a nearby degreaser unit. The presence of tetrachloroethene, which is very stable in the subsurface and the highly corroded appearance of the concrete walls in the clarifier suggest that clarifier may possibly be leaking. Additional sampling and analysis is required to determine whether the tetrachloroethene contamination found in the soil samples is due solely to leakage or to an additional source, possibly a ruptured undergound pipeline, as well.

Clarifier B-1-ZI - Although there were no indications of soil contamination noted in the drilling report, laboratory analyses

of a composite soil sample from Boring B-1-ZI, south of Clarifier B-1-ZI, showed moderate to high concentrations of several volatile organic compounds. The 1500-gallon clarifier has three stages and contains chemical processing rinse water.

Based on the available laboratory data, it is possible that Clarifier B-1-ZI is leaking. However,additional sampling and depth-specific analyses for volatile organic compounds are necessary to determine the source of the soil contamination. Suction Lysimeter B-1-ZI-SL1 should be vacuum pumped to obtain samples of soil moisture for pH and specific conductance analysis.

Clarifier B-1-ZY - Clarifier B-1-ZY is a three-stage clarifier that contains (and historically has contained) deburring agent. Laboratory analyses for depth-specific soil samples collected from Boring B-1-ZY-B1 (adjacent to the south side of the clarifier) showed low to moderate levels of tetrachloroethene in the 30- and 38-foot samples.

The drilling report indicates that a sewage odor was detected near the surface and remained present to the 38-foot depth. There is a sewer line about 20 feet southwest of Clarifier B-1-ZY and the reported odor may indicate a possible break in the line. The soil was reported to be gray in color until a depth of 38 feet, where a color change to brown was noted.

Based on the laboratory analyses, it is unlikely that Clarifier B-1-ZY is leaking.

Clarifier B-1-AH - Clarifier B-1-AH is believed to contain detergents and is used as a wash sink drainage clarifier. Laboratory analyses of the composite sample from Boring B-1-AH-B1 indicated a high level of methylene chloride contamination and a low concentration of chloroform. As no unusual odors or drastic changes in soil color were noted during the field program, no volatile organic analyses were conducted on depth-specific samples. Because the clarifier liquids contain a high concentration of 1,1 dichloroethane and this compound was not found in the soil samples, it is unlikely that Clarifier B-1-AH is leaking. A more likely source for the methylene chloride contamination is surface spills. The suction lysimeter should be monitored on a quarterly basis and samples should be analyzed for volatile organics to verify the cotamination reported for the composite sample.

Clarifier B-1-AI - Clarifier B-1-AI, is a three-stage clarifier and is located northeast of Building 141. A high level of acetone contamination was detected in the 10-foot sample taken from the boring for Suction Lysimeter B-1-AI-SL1. The composite of the samples collected from Boring B-1-AI-B1 showed no detectable concentrations of volatile organics. A liquid sample of the contents of Clarifier B-1-AI was collected and it was found that tetrachloroethene is the only volatile organic compound present at a detectable level. As this compound was not detected in the soil sample collected from the boreholes it is

unlikely that the acetone contamination is the result of clarifier leakage. In addition, there was no indication of soil contamination noted in the drilling report.

It is recommended that quarterly monitoring of suction lysimeters B-1-A1-SL1, SL2 be conducted.

Sump B-1-AM - Sump B-1-AM is used to contain waste oil and is located adjacent to Building 149. A surface stain on the surface around the sump area indicating overflow spills and a strong petroliferous odor were reported during the drilling activity. Laboratory analyses of the soil samples collected from Borings B-1-AM-B1 and B-1-AM-B2 showed high levels of several volatile organic compounds.

The petroleum hydrocarbons analysis showed very high levels of contamination in the samples collected from the 3- and 5-foot depths. This contamination is likely due to sump overflow, however, sump leakage is also a possibility as the depth to the bottom of the sump is 6 feet. High levels of volatile organic compounds were present in each of the individual depth samples. The drilling report, however, notes that the petroliferous odor decreased with depth.

Based on field observations and laboratory analysis, it is concluded that Sump B-1-AM is possibly leaking. Additional sampling and analysis is required to determine the extent of contamination in the soil around Sump B-1-AM, and to determine the source of the volitile organics.

5.0 CONCLUSIONS

During the course of this Underground Leak Detection Program, 52 underground liquid storage or short-term holding facilities were investigated. Of these, 6 are fuel tanks and 46 are non-fuel facilities consisting of 15 sumps, 24 clarifiers, and 7 tanks.

Possible soil contamination was detected in the field while drilling near 11 facilities. Results of laboratory analyses for soil samples collected near 2 fuel tanks and 18 non-fuel tanks showed low to high levels of contamination. Table 5 summarizes field and laboratory findings and provides judgement on tank integrity for both fuel tanks and non-fuel tanks.

It is postulated that fuel Tank B-1-F14 is probably leaking. For the non-fuel facilities, it is probable that Clarifier B-1-ZB is leaking. In addition, Sumps B-1-J and B-1-AM, and Clarifiers B-1-ZI and B-1-AK may possibly leak.

Evaluation of field and laboratory data has led to the conclusion that the majority of the tanks do not leak although there may be evidence of possible contamination in the surrounding soil. Some of the species of contaminants detected are not related to contents of the tanks, past or present. In some cases the species of contaminants detected match those of the historical tank contents, but the concentrations are low and there is no other evidence or knowledge indicating there may be a leak. It

TABLE 5: SUMMARY OF FIELD AND LABORATORY DATA AND TANK INTEGRITY

TANK NUMBER	FIELD INDICATIONS OF SOIL CONTAMINATION	LABORATORY INDICATIONS OF SOIL CONTAMINATION	TANK LEAKS	REMARKS
FUELS				
B-1-F1	Slight Odor	None	No	Quarterly Monitoring
B-1-F2	Slight Odor	None	No	Quarterly Monitoring
B-1-F3	None	Low Pet. Hyd.	No	Quarterly Monitoring
B-1-F4	None	None	No	Quarterly Monitoring
B-1-F13	None	None	No	Quarterly Monitoring
B-1-F14	Strong Diesel Odor	Moderate to High Pet. Hyd	Probably	Tank to be Abandoned
NON-FUELS				
B-1-C	None	High Acetone	No	Monthly Monitoring
B-1-H	None	None	No	Quarterly Monitoring
B-1-I	None	None	No	Quarterly Monitoring
B-1-J	Strong Odor	Mod. to High Vol. Org., High Pet. Hyd., Mod. As	No	Extend Sump Walls, Quarterly Monitoring
B-1-U	None	None	No	Quarterly Monitoring
B-1-Z	None	Low to Mod. MEK	Unlikely	Quarterly Monitoring
B-1-ZB	Strong PCE odor	Mod to Hi Tetrachloroethene, acetone, toluene, and benzene	Yes	Add.Sampling & Anal.
B-1-ZC	None	None	Unlikely	Vol. Org. Analysis
B-1-ZE	None	Moderate Chloroform	Unlikely	Add. Sampling and Depth-Specific Anal.
B-1-ZF	None	Mod. to High pH	No	Quarterly Monitoring
B-1-ZG	Slight Odor	None	No	Quarterly Monitoring
B-1-ZH	None	None	No	Quarterly Monitoring
B-1-ZI	None	Mod. to High Vol. Organics	No	Quarterly Monitoring
B-1-ZJ	None	Mod. Pet. Hyd.	Unlikely	Add. Sampling and Depth-Specific Anal.
B-1-ZM	None	Low Tetrachloroethene	Unlikely	Quarterly Monitoring
B-1-ZN	None	Low Chloroform	Unlikely	Quarterly Monitoring
B-1-ZP	Slight Odor	None	No	Quarterly Monitoring
B-1-ZQ	None	Mod. Sodium and Trace Cyanide	Unlikely	Add.Sampling & Anal.
B-1-ZR	None	Tr. Vol.Organics	No	Quarterly Monitoring
B-1-ZS	None	Low Vol.Organics Moderate to High Sodium & Cyanide	Possibly	Add.Sampling & Anal.
B-1-ZT	None	Trace to Low Volatile Organics	Unlikely	Quarterly Monitoring

TABLE 5 (CONTINUED): SUMMARY OF FIELD AND LABORATORY DATA AND TANK INTEGRITY

TANK NUMBER	FIELD INDICATIONS OF SOIL CONTAMINATION	LABORATORY INDICATIONS OF SOIL CONTAMINATION	TANK LEAKS	REMARKS
B-1-ZY	Slight Sewage Odor	Low to Moderate Tetrachloroethene	Unlikely	Quarterly Monitoring
B-1-AA	None	Mod. Pet. Hyd.	No	Quarterly Monitoring
B-1-AC	None	None	No	Quarterly Monitoring
B-1-AD	None	None	Dry	Abandoned
B-1-AE	None	Low Pet. Hyd.	No	Quarterly Monitoring
B-1-AH	None	High Meth. Chl. Low Chloroform	Unlikely	Quarterly Monitoring
B-1-AI	None	High Acetone	Possibly	Pipes Renovated, Clarifier Coated, Quarterly Monitoring
B-1-AJ	Slight Odor	None	No	Quarterly Monitoring
B-1-AK	Slight Odor	High CAM, Low Pet. Hyd.	No	Quarterly Monitoring
B-1-AL	None	None	No	Quarterly Monitoring
B-1-AM	Strong Oil Odor	High Vol. Org. and Pet. Hyd.	No	Extend Sump Walls, Quarterly Monitoring
B-1-AN	None	Low CAM	Unlikely	Quarterly Monitoring
B-1-AO	None	Low Tetrachloroethene	Unlikely	Quarterly Monitoring
B-1-AP	None	None	No	Quarterly Monitoring
B-1-AR	None	Mod. Sodium and Sulfate	Possibly	Quarterly Monitoring
B-1-AS	See B-1-AT	See B-1-AT	See B-1-AT	See B-1-AT
B-1-AT	None	High Chromium, Moderate Sulfate	Likely	Quarterly Monitoring
B-1-AU	Slight Odor	Mod. Chloroform	No	Quarterly Monitoring
B-1-AW	Slight Odor	Low Pet. Hyd.	No	Extend Sump Walls, Quarterly Monitoring

is not unusual for minor spillages of fluids from transfer hoses into and over fill boxes to occur during filling or vacuum pumping of tanks. Because fill boxes are usually not sealed and because there are usually cracks in asphalt or concrete surface paving, some of the spillage of fluids may percolate into the soil. Over many years, low concentrations can accumulate in the soil.

6.0 RECOMMENDATIONS

A tank integrity test should be conducted on Tank B-1-F14. Depending on the results of this test, additional subsurface sampling and analysis may be necessary to further determine the origin of the contamination and to quantify the extent of contamination. In addition, it is recommended that the vapor monitoring wells at Tank B-1-F14 be sampled and the collected gas analyzed for volatile organics using GC/MS.

Although no indications of contamination were noted during drilling at Tank B-1-C, high levels of acetone were detected in the composite soil sample in the laboratory analysis. Additional sampling and depth-specific analysis should be conducted to determine if the acetone contamination found in the composite sample is present throughout the soil profile or only near the surface. If the soil is contaminated at depths below the bottom of the tank, two additional borings should be drilled to about 40 feet and samples collected at 5, 10, 20, 30, and 40 feet.

As high levels of several organic compounds and metals were found in all of the samples collected from Boring B-1-J-B1, two additional borings should be drilled to about 60 feet and samples collected at 5, 10, 15, 20, 30, 40, 50, and 60 feet. The borings should be located at the southeast corner and along the east side of Sump B-1-J. Special precautions should be used to ensure high laboratory recovery of volatile organics, such as immersing the

samples in methanol. The sump should also be pumped and the inside steam-cleaned and inspected for obvious signs of leaks. If it is found that Sump B-1-J is not leaking, it will be necessary to study the possibility that a contaminant plume is present, possibly originating from the adjacent disposal site. Sump B-1-J should be cleaned and inspected for cracks.

The locations of underground pipes near Clarifier B-1-ZB should be investigated to determine if it is possible that the high level of tetrachloroethene reported for the 40-foot boring sample is due to a pipeline rupture. In addition, the clarifier should be cleaned and inspected for cracks. Subsequently, additional drilling should be conducted to determine the extent of the tetrachloroethene plume in the soil near Clarifier B-1-ZB.

Additional sampling and depth-specific analysis should be conducted to determine the source of the high levels of volatile organic compounds found in the composite sample collected from boring B-1-ZB-B1. If the contamination is found to be concentrated near the surface, then the source is likely from surface spills.

Laboratory results indicate that the soils around Clarifier B-1-ZE are contaminated with a moderate level of chloroform. Additional sampling and depth-specific analyses for volatile organic compounds should be conducted to determine the source of the chloroform contamination. In addition, a CAM metals analysis should be conducted to determine whether any metal contamination exists.

The moderate to high concentrations of volatile organic compounds found in the composite soil sample from Suction Lysimeter B-1-ZI-SL1 is likely the result of a surface spill. The suction lysimeter should be used to sample soil moisture for chemical analyses. Based on the results of those tests, it may be necessary to do some additional drilling and soil sampling.

The likely source of methylene chloride found in the composite soil sample from boring B-1-AH-B1 is surface spills. Suction lysimeter B-1-AH-SL1 should be monitored on a quarterly basis and samples should be analyzed for volatile organics to verify the methylene chloride contamination found in the composite sample.

It is recommended Clarifier B-1-AI be cleaned and inspected for cracks. Furthermore, Suction Lysimeter B-1-AI-SL1 should be used to sample soil moisture for chemical analyses on a quarterly basis to observe the level of acetone present. Based on the results of these tests, it may be necessary to do additional drilling and soil sampling.

Although the contamination found in the soils around the sump may be the result of sump overflow and surface spills, it has been concluded that Sump B-1-AM is possibly leaking. The sump should be cleaned and inspected for cracks. Two additional borings should be drilled to a depth of 40 feet each, one near Boring B-1-AM-B1 and one near the north corner of the sump. Depth-specific analyses should include volatile organic compounds, CAM metals, and pH.

7.0 MONITORING PROGRAM

The soil vapor monitoring wells and the suction lysimeters will be sampled quarterly to detect the presence of possible leakage of the contents of underground tanks, sumps, and clarifiers. The results of this monitoring will be accumulated and filed in an annual report to the cognizant regulatory agency. At this time, that agency is believed to be the Los Angeles County Department of Public Health.

The vapor monitoring wells will be vacuum pumped to obtain a sample of soil gas. The vacuum pumping will be accomplished through a flow-through box with several sampling ports. An HNU-PID meter will be used for routine measurements of organics. If unusual concentrations are detected, then samples of the soil gas will be collected by pumping a vapor sample through Tennex tubes. The media in the Tennex tube sorbs the organics. The sample in the Tennex tubes will be cooled and shipped to a chemical laboratory. The chemical laboratory will purge the organics into a GC column for testing. Tests during the first quarter of monitoring in 1985 will be made to establish the behavior of the vapor wells in response to pumping and levels of concentrations of organic vapors.

The suction lysimeters will be sampled by creating a vacuum in the sample collection chamber and then forcing the accumulated

TABLE 4 - TANKS WHERE LABORATORY RESULTS INDICATE SOIL CONTAMINATION

Tank Number	Indications of Contamination
Fuel Tanks	
B-1-F14	Moderate to high levels of petroleum hydrocarbons
Non-Fuel Tanks	
B-1-C	High concentration of acetone
B-1-J	High levels of volatile organic compounds and petroleum hydrocarbons; moderate to high concentrations of arsenic, barium, chromium, cobalt, nickel, vanadium, and zinc
B-1-Z	Low to moderate concentrations of methyl ethyl ketone
B-1-ZB	Moderate to high concentration of tetrachloroethene, acetone, toluene, and benzene, and moderate sodium
B-1-ZC	High concentration of sodium
B-1-ZE	Moderate concentration of chloroform
B-1-ZI	Moderate to high levels of volatile organic compounds
B-1-ZJ	Moderate levels of petroleum hydrocarbons
B-1-ZM	Low concentration of tetrachloroethene
B-1-ZN	Low concentration of chloroform
B-1-ZQ	Moderate concentration of sodium and trace cyanide
B-1-ZR	Trace to Low levels of volatile organic compounds
B-1-ZS	Low levels of volatile organic compounds; moderate to high concentrations of sodium and cyanide
B-1-ZT	Trace to Low levels of volatile organic compounds
B-1-ZY	Low to moderate concentrations of tetrachloroethene
B-1-AA	Low to moderate levels of petroleum hydrocarbons
B-1-AE	Low to moderate levels of petroleum hydrocarbons
B-1-AH	High concentration of methylene chloride, low concentration of chloroform
B-1-AI	High concentration of acetone
B-1-AK	High concentrations of barium, low concentrations of petroleum hydrocarbons, arsenic, chromium, cobalt, molybdenum, nickel, vanadium, zinc
B-1-AM	High levels of volatile organic compounds and petroleum hydrocarbons
B-1-AN	Low concentrations of beryllium, mercury, and molybdenum
B-1-AO	Low concentrations of tetrachloroethene
B-1-AR	Moderate concentrations of sodium and sulfate
B-1-AS	High concentrations of chromium; moderate concentrations of sulfate
B-1-AT	High concentrations of chromium; moderate concentrations of sulfate
B-1-AU	Moderate concentration of chloroform
B-1-AW	Low levels of petroleum hydrocarbons, chromium and zinc

PARTIALLY SCANNED
OVERSIZE ITEM(S)

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for partially scanned image(s).

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APPENDIX A
FUEL TANKS

LEGEND

SUMP WITH PUMP-OUT PORT 

3 STAGE CLARIFIER 

TANK LOCATION 

BUILDING OR LARGE PERMANENT STRUCTURE 

ABOVE GROUND PIPING 

UNDERGROUND UTILITIES:

—— —— ELECTRIC LINE

—— - —— WATER PIPE

— -- — SEWER PIPE

—v— —v— NATURAL GAS LINE

——··—— TANK PIPING

——·—— UNIDENTIFIED PIPING

—— —— COMPRESSED AIR

PROGRAM ACTIVITIES: AS PLANNED

 40-FOOT SOIL BORING

 VAPOR MONITORING WELL

 SUCTION LYSIMETER

AS COMPLETED

 40-FOOT SOIL BORING

 VAPOR MONITORING WELL

 SUCTION LYSIMETER

 VAPOR MONITORING WELL/SUCTION LYSIMETER

TANK NUMBER B-1-F1

FIELD PROGRAM

Two vapor monitoring wells were installed to monitor subsurface conditions at Tank B-1-F1.

VAPOR MONITORING WELL B-1-F1-MV1

Monitoring Installations - Vapor Monitoring Well B-1-F1-MV1 was installed as indicated in the approved work plan. The location of the vapor monitoring well is indicated on the site map.

Sampling Intervals - Soil samples were taken at a depth of 17 feet.
The monitoring well was placed slightly deeper than the approved completion depth of 15 feet to ensure that a leak in the very bottom of the tank would be detected. Monitoring below the tank is necessary because the sand that predominates the lithology is so highly conductive vertically that a liquid contaminant plume would show virtually no lateral expression.

Field Observations - The borehole was placed in the backfill material adjacent to the tank. Material extricated from the upper 7 feet of the borehole was composed primarily of pea-sized gravel. At 7 feet the material returned to the medium-brown sand indicative of native soil common in the area. The medium-to-coarse grain size of the sand remained consistent throughout the interval between 7 feet and 14 feet. At 14 feet the sand became coarser and the gravel and cobble fraction increased, which corresponds to the color change at the same depth. Shards of pottery and other debris were encountered throughout the borehole. The soil was brown in color throughout the first 14 feet. At 14 feet the color changed from brown to variegated light brown which corresponds with a general grain size increase at the same depth.

Indications of possible contamination were based on observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

VAPOR MONITORING WELL B-1-F1-MV2

Monitoring Installations - Vapor Monitoring Well B-1-F1-MV2 was installed to monitor the diesel tank as indicated in the approved Work Plan. The vapor monitoring well also monitors the south end of Tank B-1-F2. The location of the well is indicated on the site map.

TANK B-1-F1 (continued)

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 17 feet.

The monitoring well was placed slightly deeper than the approved completion depth of 15 feet to ensure that a leak in the very bottom of the tank would be detected. Monitoring below the tank is necessary because the sand that predominates the lithology is so highly conductive vertically that a liquid contaminant plume would show virtually no lateral expression.

Field Observations - The medium-to-coarse grain size and brown color of the sand remained consistent throughout the first 14 feet of the vapor monitoring well. At 14 feet the sand became coarser and the gravel and cobble fraction increased, which corresponds to a color change at the same depth. At 14 feet the color changed from brown to variegated light brown. Quantities of pottery and brick fragments were encountered throughout the excavation.

There were no indications of contamination. The soil at 15 feet had a slight odor indicating possible contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Samples were collected from Vapor Monitoring Wells B-1-F1-MV1 and B-1-F1-MV2 and analyzed for petroleum hydrocarbons as approved in the Work Plan.

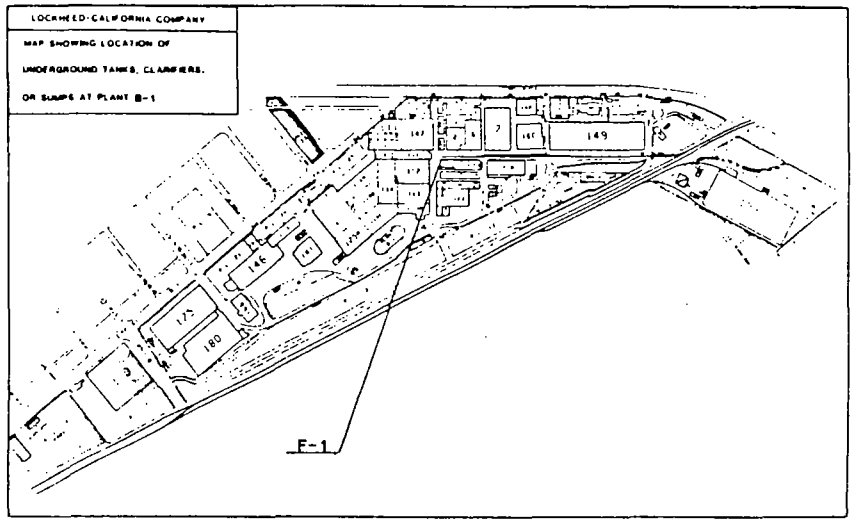
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-F1. The levels of petroleum hydrocarbons in both Well B-1-F1-MV1 and B-1-F1-MV2 samples are below the limit of detection.

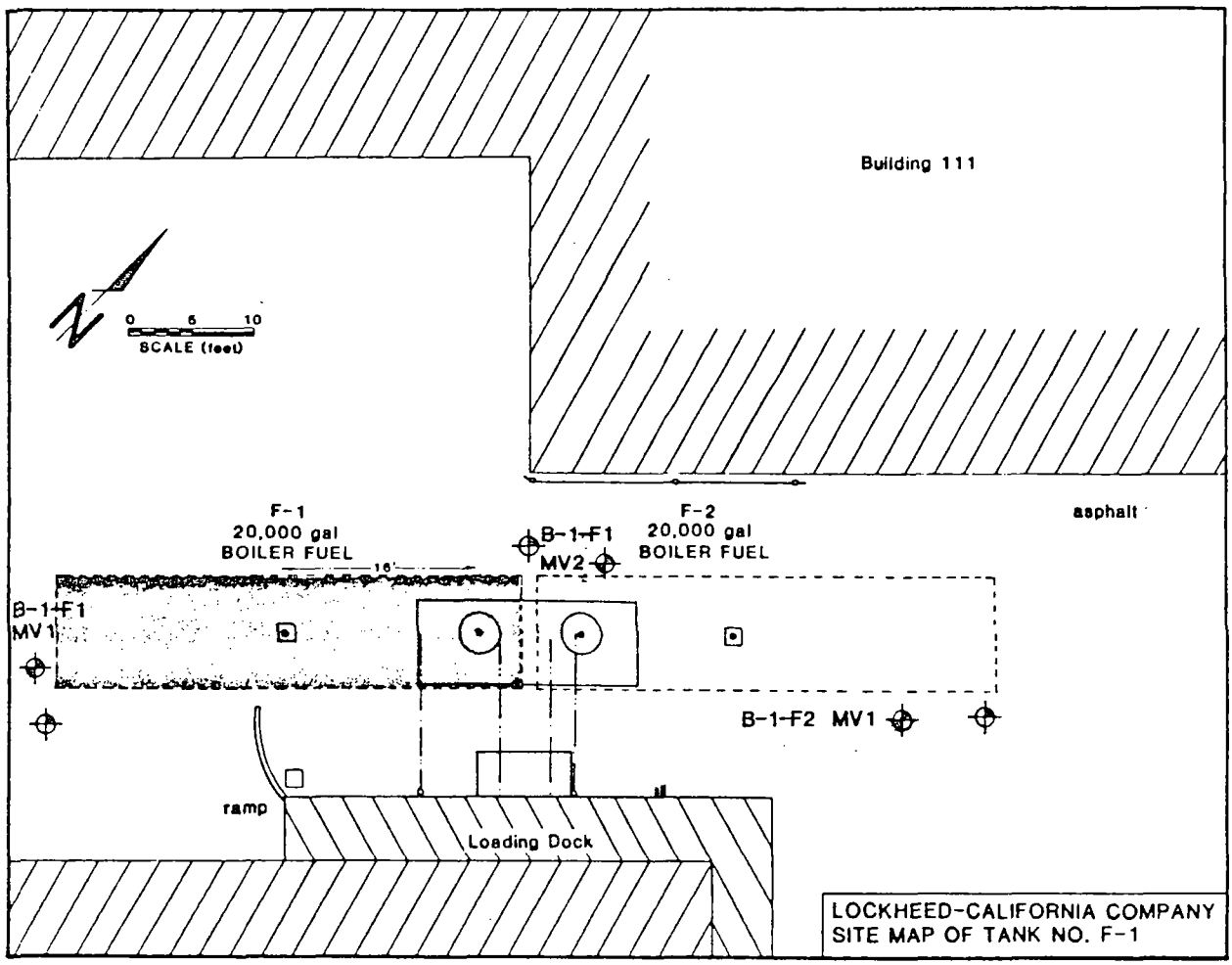
CONCLUSIONS

Based upon field observations and laboratory analyses, it is concluded that Tank B-1-F1 is not leaking.

RECOMMENDATION

Proceed with quarterly monitoring of the wells.

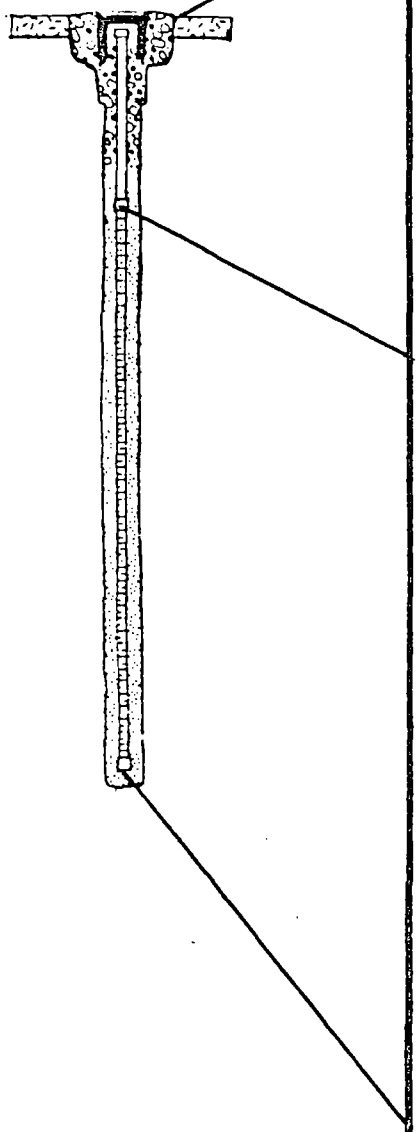

LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
F-1


Building 111
0 5 10
SCALE (feet)
F-1
20,000 gal
BOILER FUEL
B-1-F1
MV2
F-2
20,000 gal
BOILER FUEL
asphalt
16'
B-1-F1
MV1
B-1-F2 MV1
ramp
Loading Dock
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. F-1

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		F-1
Plant No./Nearest Bldg.		B-1/Bldg. 140 (W Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	20,000
	Use/Process	Boiler fuel
	Contents (past,CAS No.,date)	Diesel #2 Boiler 68334305
	(present,CAS No.)	Diesel #2 Boiler 68334305
	Construction Materials	Steel
	Geometry	Cylindrical
	Depth To Top	6 ft
	Depth To Invert	14.6 ft
	Diameter	9.5 ft
	Length (1)	38 ft
	Containment	None
	Corrosive Protection (2)	Ext. coated
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	Spill plume in area
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	2
	Samples Depths	MV1/Grab 10ft;20ft MV2/17 ft
	Co[illegible]terval	MV1/7-18.6 ft MV2/7-17.9 ft
Laboratory Program (4)		
	No. of Tank Contents Samples	0
	Parameters	
	No. of Tank Soil Samples	1
	Parameters	Hydrocarbons

0837

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		Grab Grab	-Asphalt -Artificial Fill:Sand, medium grain,brown, w/pea gravel -Native material: Sand,medium to coarse grain,brown,w/cobbles to 5-in diameter clay pottery fragments throughout -Sand,medium to coarse grain,brown,w/gravel & cobbles

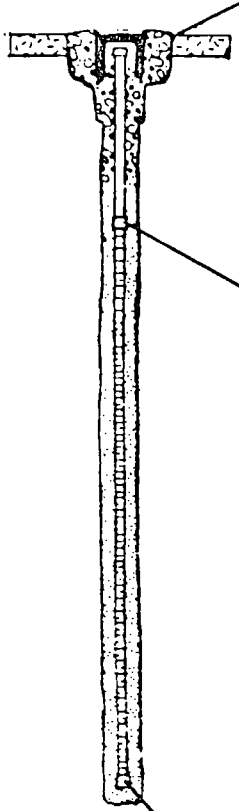
COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-7 ft
-Screened 2-in I.D. PVC pipe, 7-18.6 ft
-Concrete, 0-5 ft
-Bentonite, 5-6 ft
-Clean sand, 6-20 ft

TANK NO. B-1-F1

MONITORING WELL NO. B-1-F1-MV1

GREGG & ASSOCIATES, INC.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		50+	-Aspahlt -Sand,medium to coarse grain,brown,abundant gravel, At 1.5 ft, large cobble, 18-in diameter, subangular,granodiorite -Sand,medium to very coarse grain,variegated, w/gravel -Slight odor

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-7 ft
-Screened 2-in I.D. PVC pipe, 7-17.9 ft
-Concrete, 0-5 ft
-Bentonite, 5-6 ft
-Clean sand, 6-18 ft

TANK NO. B-1-F1

MONITORING WELL NO. B-1-F1-MV2

GREGG & ASSOCIATES, INC.

TABLE B-1-F1: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-F1 MW1 20 ft.	B-1-F1 MW2 17 ft.
Volatile Organics (ug/kg)		N.A.	N.T.	N.T.
Benzene	<0.2			
Ethyl Benzene	<0.1			
Chloroform	<0.1			
Chloromethane	<0.2			
Chloroethane	<0.8			
1,1-Dichloroethane	<0.1			
1,2-Dichloroethane	<0.1			
1,2-Dichloropropane	<0.1			
1,1,1-Trichlorethane	<0.2			
1,1,2-Trichloroethane	<0.1			
Bromodichloromethane	<0.1			
Dibromochloromethane	<0.1			
1,1-Dichloroethene	<0.1			
trans-1,2-Dichloroethene	<0.1			
Trichloroethene	<0.3	* 2,040		
Tetrachloroethene	<0.4			
Toluene	<0.4			
Methyl Ethyl Ketone	<0.5			
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	<2.0	<2.0
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.
CAM Metals (mg/kg)			N.T.	N.T.
Antimony	<2.5	500		
Arsenic	13.4	500		
Barium	91.9	10,000		
Beryllium	<1.0	75		
Cadmium	<2.5	100		
Chromium (Total)	9.6	2,500		
Cobalt	6.5	8,000		
Copper	22.1	250		
Lead	<2.5	1,000		
Mercury	<0.1	20		
Molybdenum	6.3	3,500		
Nickel	8.4	2,000		
Selenium	<2.5	100		
Silver	<2.5	500		
Thallium	<2.5	700		
Vanadium	22.0	2,400		
Zinc	38.7	2,500		
Others			N.T.	N.T.
pH (standard units)	8.24	N.A.		
Sodium (mg/kg)	N.T.	N.A.		
Cyanide (mg/kg)	<0.2	N.A.		
Sulfate (mg/kg)	N.T.	N.A.		

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-F2

FIELD PROGRAM

Two vapor monitoring wells were installed to monitor subsurface conditions at Tank B-1-F2. One of the wells, labeled B-1-F1-MV2, monitors both the north end of Tank B-1-F1 and the south end of Tank B-1-F2.

VAPOR MONITORING WELL B-1-F2-MV1

Monitoring Installations - Vapor Monitoring Well B-1-F2-MV1 was installed to monitor the diesel tank as indicated in the approved Work Plan. The location of the vapor monitoring well is indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 17 feet.

The monitoring well was placed slightly deeper than the approved completion depth of 15 feet to ensure that a leak in the very bottom of the tank would be detected. Monitoring below the tank is necessary because the sand that predominates the lithology is so highly conductive vertically that a liquid contaminant plume would show virtually no lateral expression.

Field Observations - The borehole was placed in the backfill of the tank. Material excavated from the borehole consisted primarily of pea-gravel fill. Natural material composed of brown, medium-to- coarse grain sand started at 16 feet and continued through 17 feet. The frequency of cobbles increased at 14 feet and continued to 15 feet. The soil was brown in color throughout the borehole.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. The soil at 10 feet had a slight odor indicating possible contamination.

VAPOR MONITORING WELL B-1-F2-MV2

Monitoring Installations - Vapor Monitoring Well B-1-F2-MV2 was installed to monitor the diesel tank as indicated in the approved Work Plan. The vapor monitoring well monitors the south end of Tank B-1-F2 and the north end of Tank B-1-F1. The location of the vapor monitoring well is indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 17 feet.

The monitoring well was placed slightly deeper than the approved completion depth of 15 feet to ensure that a leak in the very bottom of the tank would be detected. Monitoring below the tank is necessary because the sand that predominates the lithology is so highly conductive vertically that a liquid contaminant plume would show virtually no lateral expression.

Field Observations - The medium-to-coarse grain size of the sand remained consistent throughout the first 14 feet of the vapor monitoring well. At 14 feet the sand became coarser and the gravel and cobble fraction increased, which corresponds to the color change at the same depth. There was a large number of pottery and brick fragments throughout the excavation. The soil was brown in color throughout the first 14 feet. At 14 feet the color changed from brown to variegated light brown, which corresponds with a general grain size increase at the same depth.

The soil had a slight odor indicating possible contamination at 15 feet.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - A sample was collected from Vapor Monitoring Well B-1-F2-MV1 and analyzed for petroleum hydrocarbons as approved in the Work Plan.

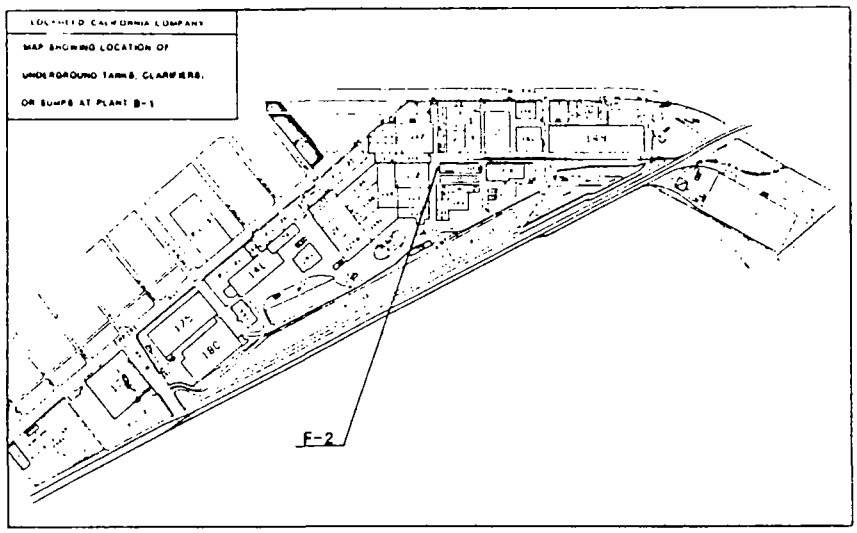
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-F2. The level of petroleum hydrocarbons in the sample is below the limit of detection.

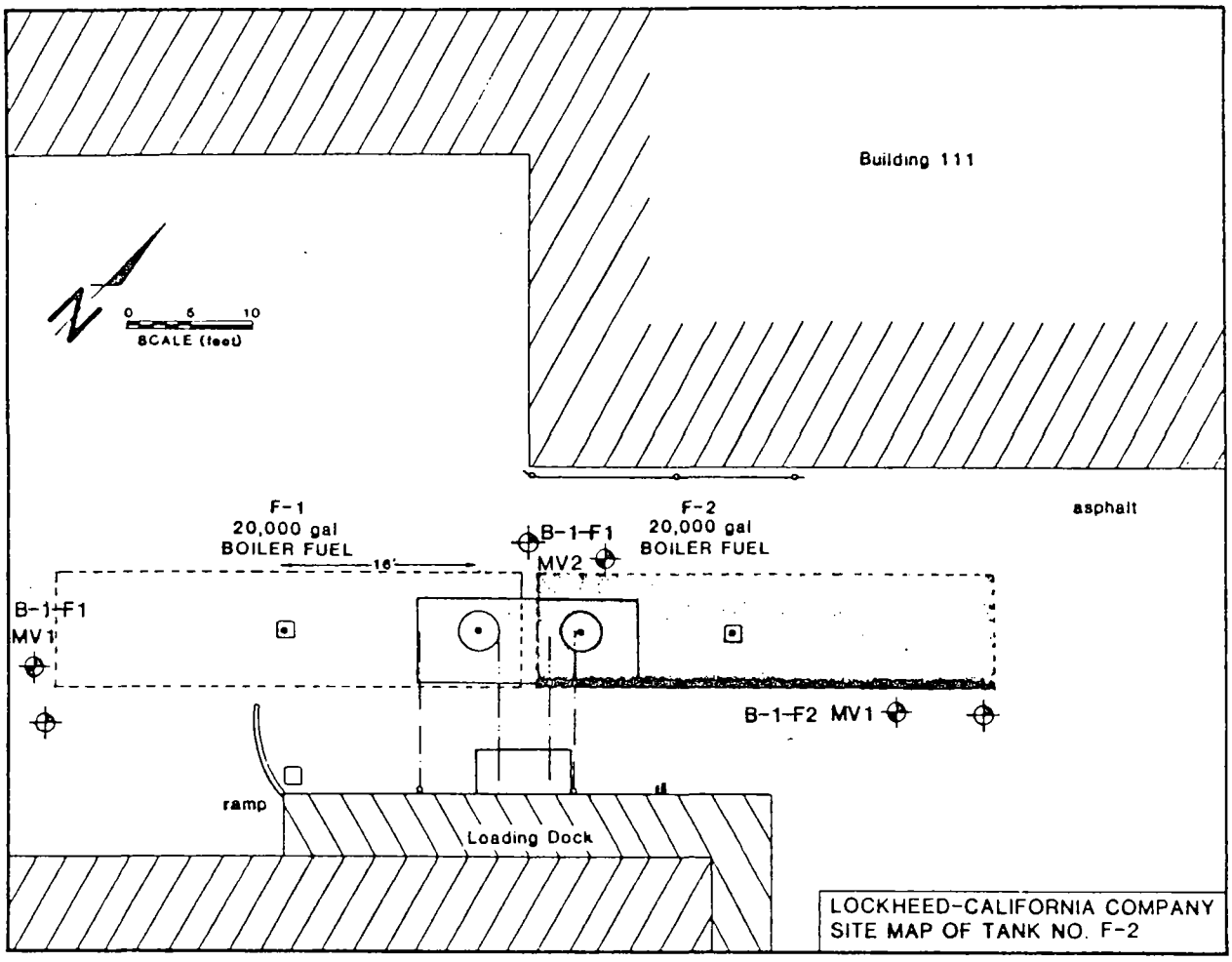
CONCLUSIONS

Based upon field observations and laboratory analysis, it is concluded that Tank B-1-F2 is not leaking.

RECOMMENDATION

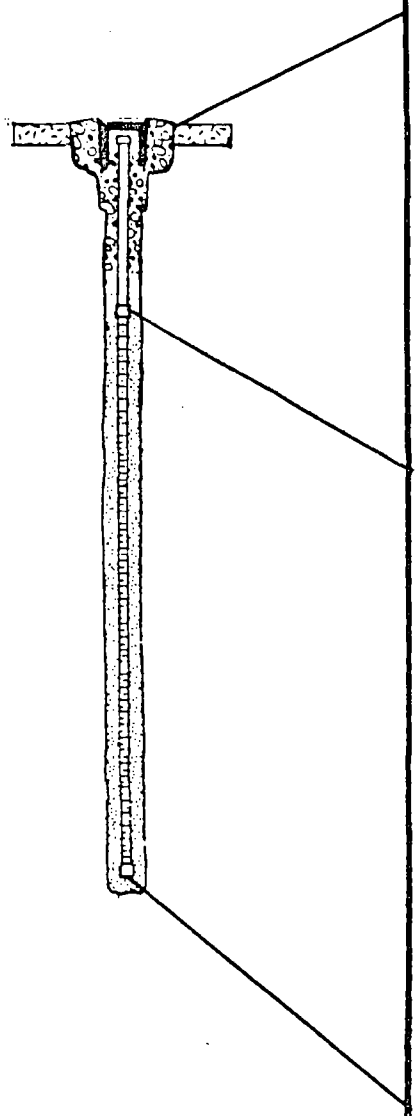
Proceed with quarterly monitoring of the wells.


MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
F-2


Building 111
0 5 10
SCALE (feet)
F-1
20,000 gal
BOILER FUEL
B-1-F1
MV2
F-2
20,000 gal
BOILER FUEL
asphalt
16'
B-1-F1
MV1
B-1-F2 MV1
ramp
Loading Dock
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. F-2

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		F-2
Plant No./Nearest Bldg.		B-1/Bldg. 140 (N Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	20,000
	Use/Process	Boiler fuel
	Contents (past,CAS No.,date)	Diesel #2 Boiler 68334305
	(present,CAS No.)	Diesel #2 Boiler 68334305
	Construction Materials	Steel
	Geometry	Cylindrical
	Depth To Top	6 ft
	Depth To Invert	14.6 ft
	Diameter	9.5 ft
	Length (1)	38 ft
	Containment	None
	Corrosive Protection (2)	Ext. coated
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	Spill plume in area
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	1
	Samples Depths	MW1/17 ft
	Completion Interval	MW1/7-16.8 ft
Laboratory Program (4)		
	No. of Tank Contents Samples	0
	Parameters	
	No. of Tank Soil Samples	2
	Parameters	Hydrocarbons

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		45	-Aspahlt -Artificial Fill:Sand & gravel, Sand,coarse grain,brown, Gravel, variegated occasional cobbles -Slight odor,diminishes quickly -Abundant gravel & small cobbles -Native material: Sand, medium to coarse grain, brown,w/gravel

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-7 ft
-Screened 2-in I.D. PVC pipe, 7-16.8 ft
-Concrete, 0-5 ft
-Bentonite, 5-6 ft
-Clean sand, 6-17 ft

TANK NO. B-1-F2

MONITORING WELL NO. B-1-F2-MV1

GREGG & ASSOCIATES, INC.

TABLE B-1-F2: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-F2 MW1 5 ft.
Volatile Organics (ug/kg)		N.A.	N.T.
Benzene	<0.2		
Ethyl Benzene	<0.1		
Chloroform	<0.1		
Chloromethane	<0.2		
Chloroethane	<0.8		
1,1-Dichloroethane	<0.1		
1,2-Dichloroethane	<0.1		
1,2-Dichloropropane	<0.1		
1,1,1-Trichlorethane	<0.2		
1,1,2-Trichloroethane	<0.1		
Bromodichloromethane	<0.1		
Dibromochloromethane	<0.1		
1,1-Dichloroethene	<0.1		
trans-1,2-Dichloroethene	<0.1		
Trichloroethene	<0.3	* 2,040	
Tetrachloroethene	<0.4		
Toluene	<0.4		
Methyl Ethyl Ketone	<0.5		
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	<2.0
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.
CAM Metals (mg/kg)			N.T.
Antimony	<2.5	500	
Arsenic	13.4	500	
Barium	91.9	10,000	
Beryllium	<1.0	75	
Cadmium	<2.5	100	
Chromium (Total)	9.6	2,500	
Cobalt	6.5	8,000	
Copper	22.1	250	
Lead	<2.5	1,000	
Mercury	<0.1	20	
Molybdenum	6.3	3,500	
Nickel	8.4	2,000	
Selenium	<2.5	100	
Silver	<2.5	500	
Thallium	<2.5	700	
Vanadium	22.0	2,400	
Zinc	38.7	2,500	
Others			N.T.
pH (standard units)	8.24	N.A.	
Sodium (mg/kg)	N.T.	N.A.	
Cyanide (mg/kg)	<0.2	N.A.	
Sulfate (mg/kg)	N.T.	N.A.	

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-F3

FIELD PROGRAM

One vapor monitoring well was installed to monitor subsurface conditions at Tank B-1-F3.

Monitoring Installations - Although this tank was noted in the Work plan, no specific program was discussed. Recent resurfacing of the area made locating the tank very difficult. Subsequent to submission of the Work Plan, the tank was located and drilling performed in a manner consistent with similar facilities at Plant B-1. The location of the tank and the adjacent vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 12 feet, slightly below the bottom of the tank.

Field Observations - The medium-to-coarse grain size and brown color of the sand remained consistent throughout the first 8 feet. At 8 feet the sand became coarser and the gravel and cobble fraction increased, which corresponds to the color change at the same depth. At 8 feet the color changed from brown to variegated light brown. The occurrence of cobbles remained frequent throughout the excavation. Construction debris such as brick and steel reinforcing bars was encountered in the upper 3 feet of the borehole.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - A sample was collected from Vapor Monitoring Well B-1-F3-MV1 and analyzed for petroleum hydrocarbons as approved in the work plan.

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-F3. A low level of petroleum hydrocarbons (5.3 mg/kg) was found in the sample.

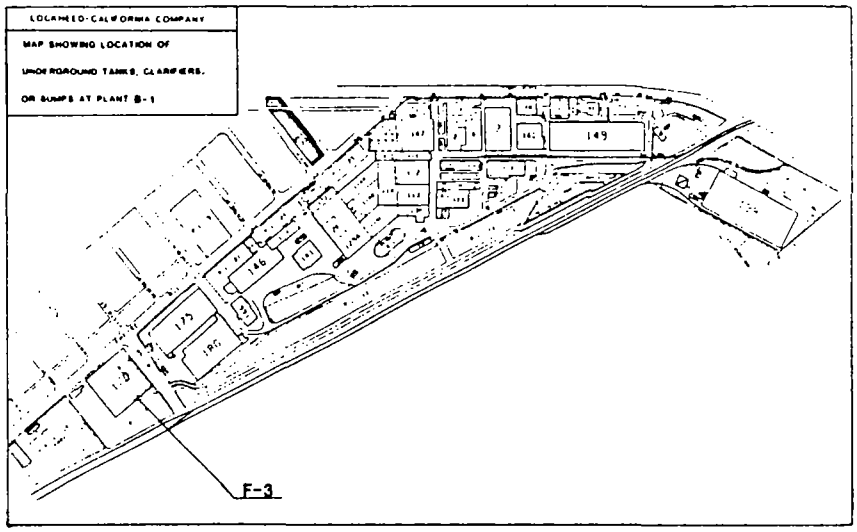
CONCLUSIONS

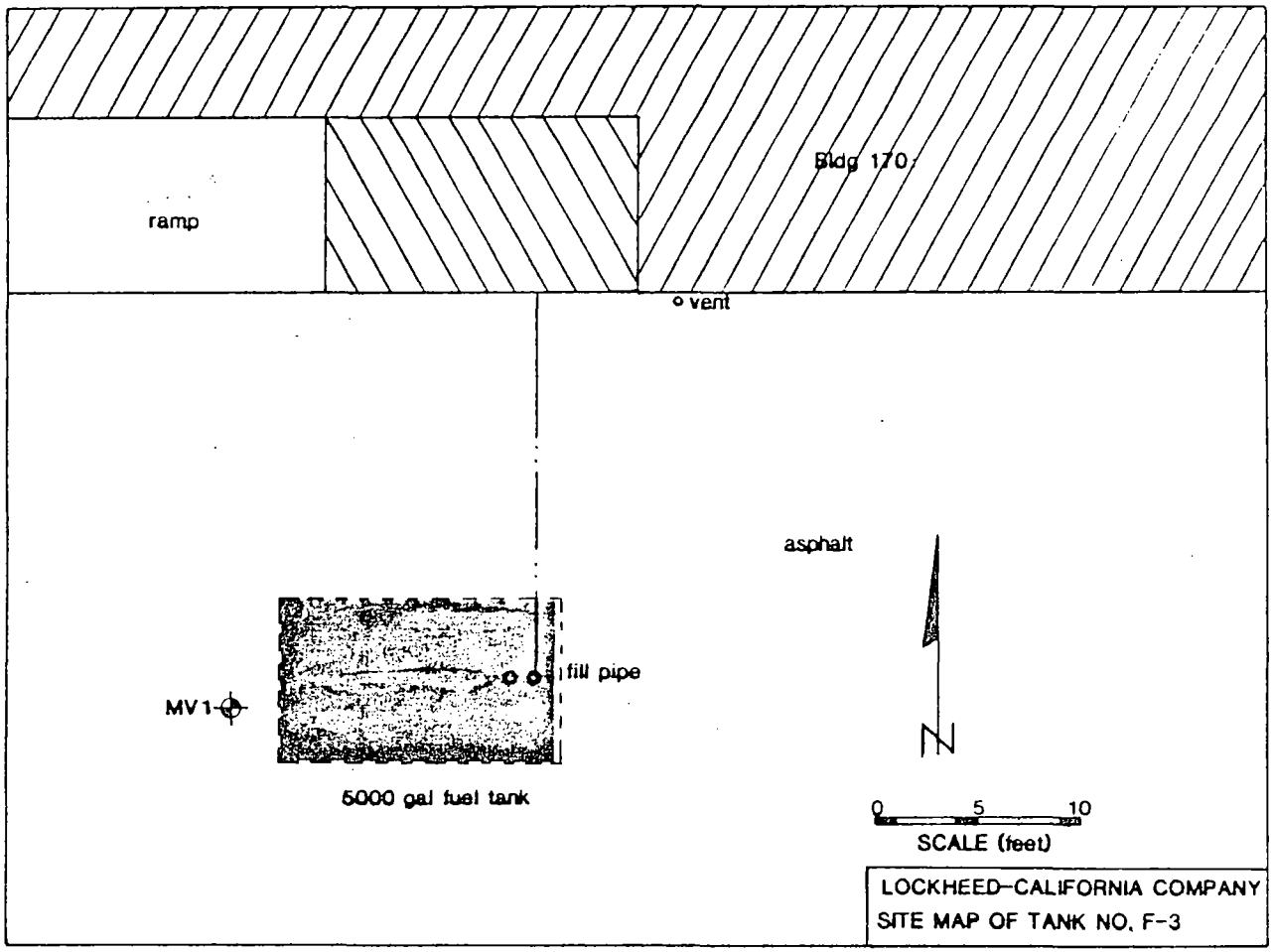
Based upon field observations and laboratory analysis, it is concluded that Tank B-1-F3 is not leaking. The low level of petroleum hydrocarbons (5.3 mg/kg) reported for sample B-1-F3-MV1, is likely due to surface spills or other surface sources rather than to tank leakage.

TANK B-1-F3 (continued)

RECOMMENDATION

Proceed with quarterly monitoring of the wells.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
F-3


Bldg 170
ramp
vent
asphalt
fill pipe
MV1
5000 gal fuel tank
0 5 10
SCALE (feet)
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. F-3

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		F-3
Plant No./Nearest Bldg.		B-1/Bldg. 170 (S Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	5,000
	Use/Process	Boiler fuel
	Contents (past,CAS No.,date)	Diesel #2 Boiler 68334305
	(present,CAS No.)	Diesel #2 Boiler 68334305
	Construction Materials	Steel
	Geometry	Cylindrical
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Ext. coated
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	Good
	Surface Contamination	None
Drilling Program:	Rig Type/Requirements (3)	H.S.Auger
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	1
	Samples Depths	MW1/12 ft
	Completion Interval	MW1/5-11 ft
Laboratory Program (4)		
	No. of Tank Contents Samples	0
	Parameters	
	No. of Tank Soil Samples	1
	Parameters	Hydrocarbons

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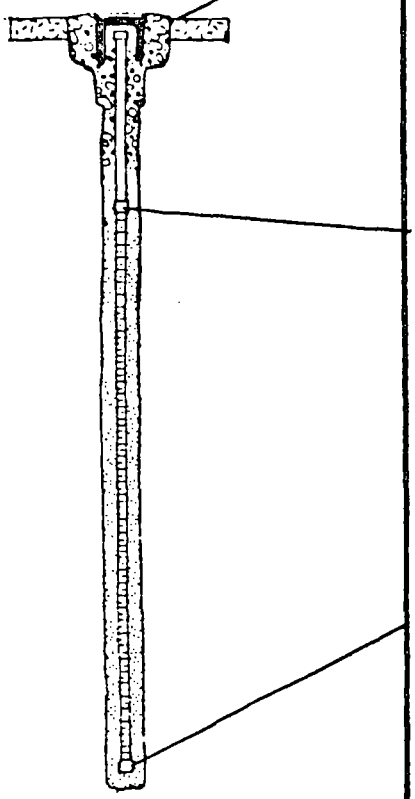
CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		35	Aspahlt Sand,fine to medium grain,brown,moist, abundant debris,brick, reinforcing bar,etc. w/some coarse sand & gravel Sand,medium to coarse grain,variegated brown, w/gravel & cobbles to 3-in diameter

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-5 ft
-Screened 2-in I.D. PVC pipe, 5-11 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-12 ft

TANK NO. B-1-F3

MONITORING WELL NO. B-1-F3-MV1

GREGG & ASSOCIATES, INC.

TABLE B-1-F3: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-F3 MW1 12 ft.
Volatile Organics (ug/kg)		N.A.	N.T.
Benzene	<0.2		
Ethyl Benzene	<0.1		
Chloroform	<0.1		
Chloromethane	<0.2		
Chloroethane	<0.8		
1,1-Dichloroethane	<0.1		
1,2-Dichloroethane	<0.1		
1,2-Dichloropropane	<0.1		
1,1,1-Trichlorethane	<0.2		
1,1,2-Trichloroethane	<0.1		
Bromodichloromethane	<0.1		
Dibromochloromethane	<0.1		
1,1-Dichloroethene	<0.1		
trans-1,2-Dichloroethene	<0.1		
Trichloroethene	<0.3	* 2,040	
Tetrachloroethene	<0.4		
Toluene	<0.4		
Methyl Ethyl Ketone	<0.5		
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	5.3
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.
CAM Metals (mg/kg)			N.T.
Antimony	<2.5	500	
Arsenic	13.4	500	
Barium	91.9	10,000	
Beryllium	<1.0	75	
Cadmium	<2.5	100	
Chromium (Total)	9.6	2,500	
Cobalt	6.5	8,000	
Copper	22.1	250	
Lead	<2.5	1,000	
Mercury	<0.1	20	
Molybdenum	6.3	3,500	
Nickel	8.4	2,000	
Selenium	<2.5	100	
Silver	<2.5	500	
Thallium	<2.5	700	
Vanadium	22.0	2,400	
Zinc	38.7	2,500	
Others			N.T.
pH (standard units)	8.24	N.A.	
Sodium (mg/kg)	N.T.	N.A.	
Cyanide (mg/kg)	<0.2	N.A.	
Sulfate (mg/kg)	N.T.	N.A.	

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-F4

FIELD PROGRAM

Two vapor monitoring wells were installed to monitor subsurface conditions at Tank B-1-F4.

VAPOR MONITORING WELL B-1-F4-MV1

Monitoring Installations - Vapor Monitoring Well B-1-F4-MV1 was installed to monitor the diesel tank slightly north of the approved location due to reassessment of locations of underground pipes. Both the actual and approved locations of the vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 12 feet, as approved in the work plan.

Field Observations - The medium grain size of the sand remained consistent throughout the first 10 feet of the vapor monitoring well. At 10 feet the sand became coarser and the gravel and cobble fraction increased, which corresponds to the color change at the same depth. The soil was brown in color throughout the first 10 feet. At 10 feet the color changed from brown to variegated light brown which corresponds with a general grain size increase at the same depth. The frequency of cobbles decreased at 8 feet and increased again at 10 feet.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

VAPOR MONITORING WELL B-1-F4-MV2

Monitoring Installations - Vapor Monitoring Well B-1-F4-MV2 was installed to monitor the diesel tank slightly east of the approved location due to interference from underground pipes, Five attempts were made to install the vapor monitoring well to the planned depth. Underground obstructions, however, prevented successful completion. The first, second and fourth attempts each struck steel pipes at depths of 3, 1 and 3 feet respectively. The third attempt hit cement 5 feet below the ground surface. The fifth attempt reached a successful depth of completion. Both the actual and approved locations of the vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 12 feet, as approved in the work plan.

Field Observations - The medium grain size of the sand remained consistent throughout the first 5 feet of the vapor monitoring well. At 5 feet the sand became coarser, which corresponds to the color change at the same depth. The soil was brown in color throughout the first 5 feet. From 5 feet to 8 feet the color changed from brown to light brown which corresponds with a general grain size increase at the same depth. The frequency of cobbles increased at 9 feet and continued to 11 feet.

There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Samples were collected from Vapor Monitoring Wells B-1-F4-MV1 and B-1-F4-MV2 and analyzed for petroleum hydrocarbons as approved in the work plan.

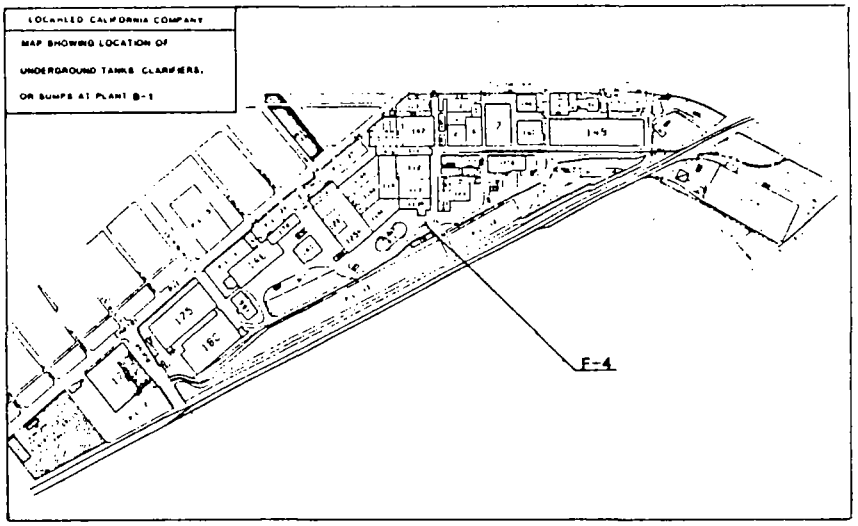
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-F4. The levels of petroleum hydrocarbons in both the MV1 and MV2 samples are below the limit of detection.

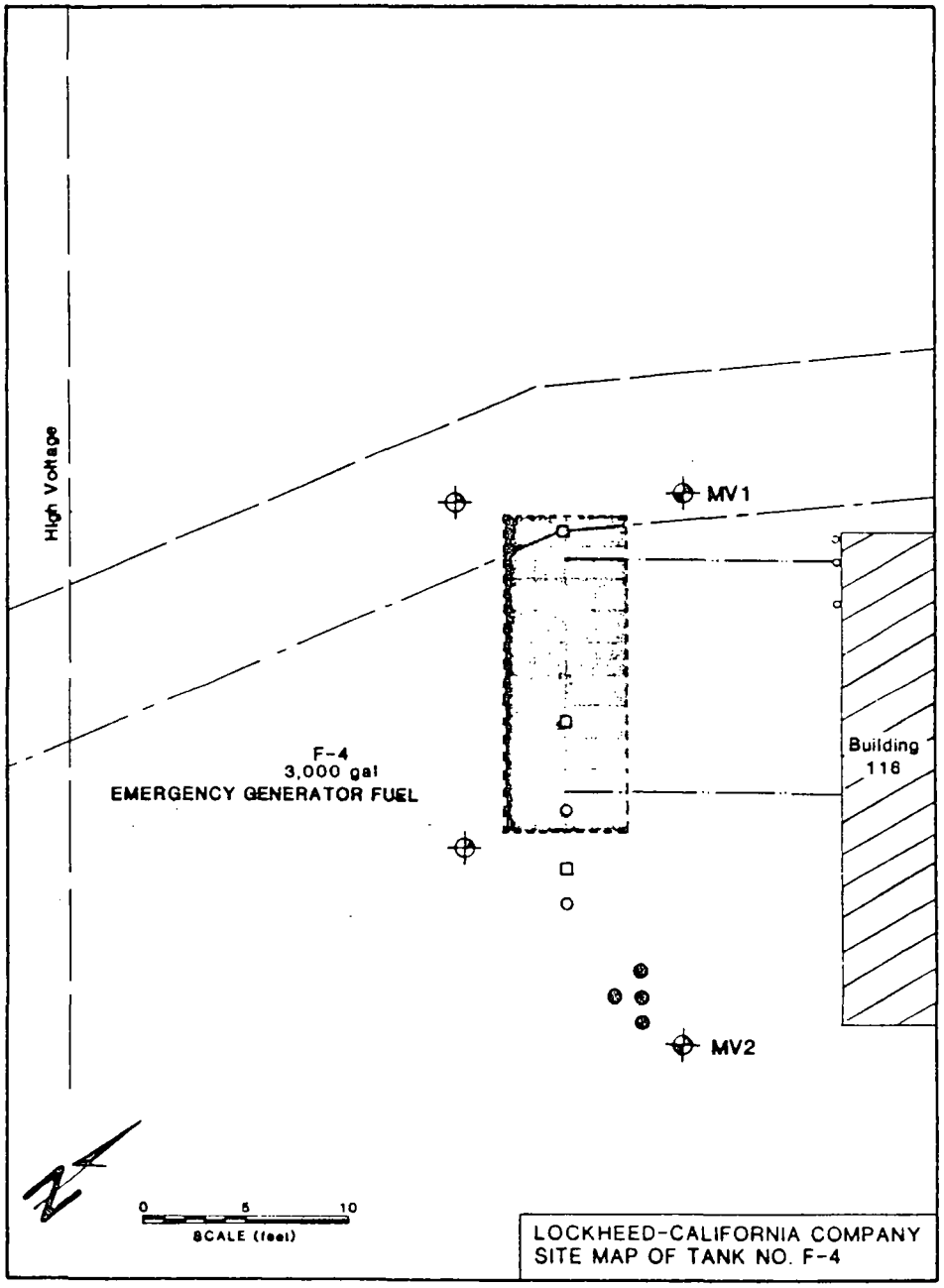
CONCLUSIONS

Based upon field observations and laboratory analyses, it is concluded that Tank B-1-F4 is not leaking.

RECOMMENDATION

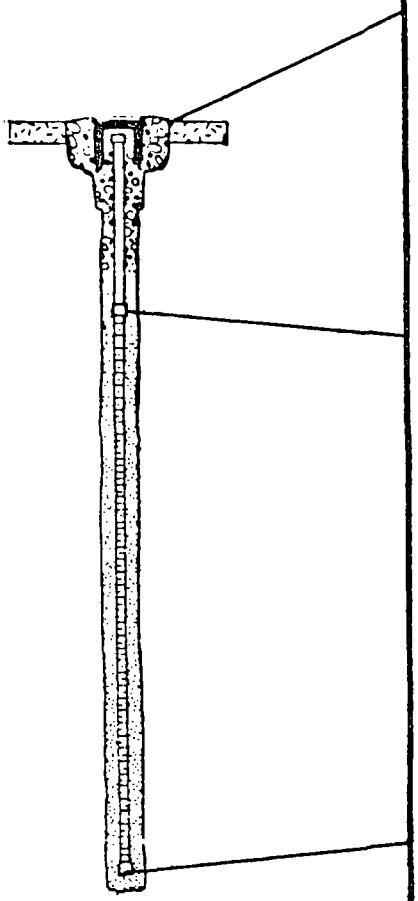
Proceed with quarterly monitoring of the wells.


LOCKHEED CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS CLARIFIERS,
OR SUMPS AT PLANT B-1
F-4


High Voltage
MV1
F-4
3,000 gal
EMERGENCY GENERATOR FUEL
Building
116
MV2
0
5
10
SCALE (feet)
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. F-4

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		F-4
Plant No./Nearest Bldg.		B-1/Bldg. 116 (S Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	3,000
	Use/Process	Emergency generator fuel
	Contents (past,CAS No.,date)	Diesel #2 Boiler 68334305
	(present,CAS No.)	Diesel #2 Boiler 68334305
	Construction Materials	Steel
	Geometry	Cylindrical
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Ext. coated
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	2
	Samples Depths	MV1/12 ft MV2/12 ft
	Completion Interval	MV1/5-12.75 ft MV2/5-13.4 ft
Laboratory Program (4)	No. of Tank Contents Samples	0
	Parameters	
	No. of Tank Soil Samples	2
	Parameters	Hydrocarbons

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		50+	Asphalt Sand, medium grain, brown, very loose, w/ gravel to 2-in diameter gravel continues to 8 ft Sand, medium to coarse grain, variegated medium brown, w/gravel to 1-in diameter

COMPLETION & BACKFILL

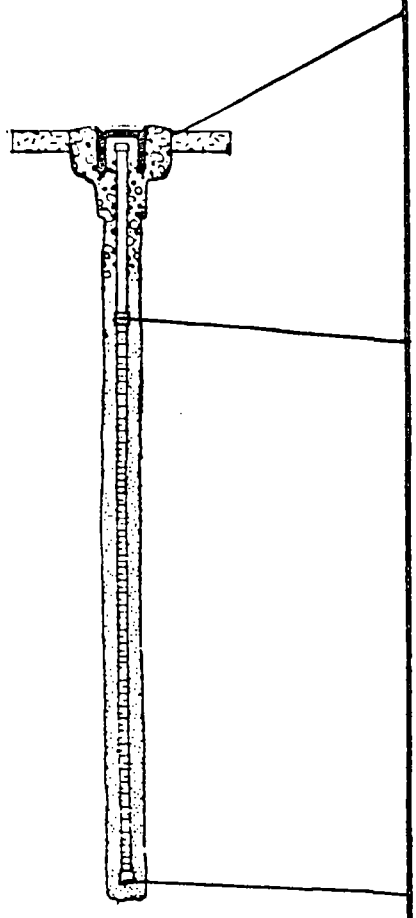
- Blank 2-in I.D. PVC pipe, 0-5 ft
- Screened 2-in I.D. PVC pipe, 5-12.75 ft
- Concrete, 0-4 ft
- Bentonite, 4-5 ft
- Clean sand, 5-13 ft

TANK NO. B-1-F4

MONITORING WELL NO. B-1-F4-MV1

GREGG & ASSOCIATES, INC.

0837

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			-Asphalt
	- 1 -			-Sand,medium grain,brown, loose,w/gravel to 2-in diameter
	- 2 -			
	- 3 -			
	- 4 -			
	- 5 -			-Sand,fine grain,light brown,loose
	- 6 -			
	- 7 -			
	- 8 -			
	- 9 -			-cobbles to 1-in diameter
	- 10 -			
	- 11 -			
	- 12 -		33	-Sand,medium grain,brown
	- 13 -			
	- 14 -			
	- 15 -			
	- 16 -			
	- 17 -			
	- 18 -			
	- 19 -			
	- 20 -			

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-5 ft
-Screened 2-in I.D. PVC pipe, 5-13.4 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-13 ft

TANK NO. B-1-F4

MONITORING WELL NO. B-1-F4-MV2

GREGG & ASSOCIATES, INC.

TABLE B-1-F4: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-F4 MW1 12 ft.	B-1-F4 MW2 12 ft.
Volatile Organics (ug/kg)		N.A.	N.T.	N.T.
Benzene	<0.2			
Ethyl Benzene	<0.1			
Chloroform	<0.1			
Chloromethane	<0.2			
Chloroethane	<0.8			
1,1-Dichloroethane	<0.1			
1,2-Dichloroethane	<0.1			
1,2-Dichloropropane	<0.1			
1,1,1-Trichlorethane	<0.2			
1,1,2-Trichloroethane	<0.1			
Bromodichloromethane	<0.1			
Dibromochloromethane	<0.1			
1,1-Dichloroethene	<0.1			
trans-1,2-Dichloroethene	<0.1			
Trichloroethene	<0.3	* 2,040		
Tetrachloroethene	<0.4			
Toluene	<0.4			
Methyl Ethyl Ketone	<0.5			
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	<2.0	<2.0
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.
CAM Metals (mg/kg)			N.T.	N.T.
Antimony	<2.5	500		
Arsenic	13.4	500		
Barium	91.9	10,000		
Beryllium	<1.0	75		
Cadmium	<2.5	100		
Chromium (Total)	9.6	2,500		
Cobalt	6.5	8,000		
Copper	22.1	250		
Lead	<2.5	1,000		
Mercury	<0.1	20		
Molybdenum	6.3	3,500		
Nickel	8.4	2,000		
Selenium	<2.5	100		
Silver	<2.5	500		
Thallium	<2.5	700		
Vanadium	22.0	2,400		
Zinc	38.7	2,500		
Others			N.T.	N.T.
pH (standard units)	8.24	N.A.		
Sodium (mg/kg)	N.T.	N.A.		
Cyanide (mg/kg)	<0.2	N.A.		
Sulfate (mg/kg)	N.T.	N.A.		

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-F13

FIELD PROGRAM

Two vapor monitoring wells were installed to monitor subsurface conditions at Tank B-1-F13.

VAPOR MONITORING WELL B-1-F13-MV1

Monitoring Installations - Vapor Monitoring Well B-1-F13-MV1 was installed to monitor the diesel tank slightly west of the approved location due to proximity to overhead power lines. Both the actual and approved locations of the vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 12 feet, as approved in the work plan.

Field Observations - The very fine to coarse grain size of the sand remained consistent throughout the first 7 feet of the vapor monitoring well. At 7 feet the sand became coarser. The soil was dark brown in color throughout the first 7 feet. At 7 feet the color changed from dark brown to light brown.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

VAPOR MONITORING WELL B-1-F13-MV2

Monitoring Installations - Vapor Monitoring Well B-1-F13-MV2 was installed to monitor the diesel tank west of the approved location due to proximity to overhead power lines. Two attempts were made to install the vapor monitoring well to the planned depth; underground obstructions prevented successful completion of the first attempt. The second attempt reached a successful depth of completion. Both the actual and approved locations of the vapor monitoring well is indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 12 feet, as approved in the work plan.

Field Observations - There was a thin layer of gravel fill directly beneath the asphalt surface. The medium grain size of the sand remained consistent throughout the first 10 feet of the vapor monitoring well. At 10 feet the sand became slightly coarser. The soil was brown in color throughout the first 4.5

feet. At 4.5 feet through 12 feet the color changed from brown to light brown.

There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Samples were collected from Vapor Monitoring Wells B-1-F13-MV1 and B-1-F13-MV2 and a composite was analyzed for for petroleum hydrocarbons as approved in the work plan.

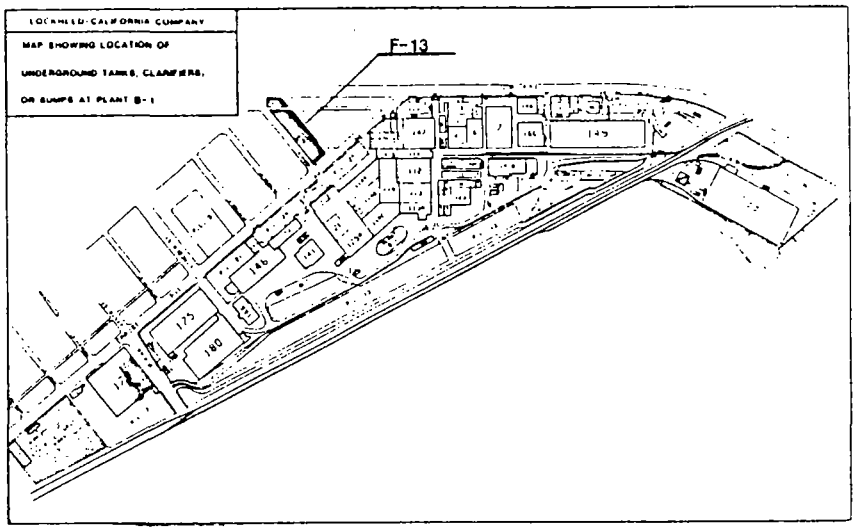
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-F13. The level of petroleum hydrocarbons found in the composite sample is below the limit of detection.

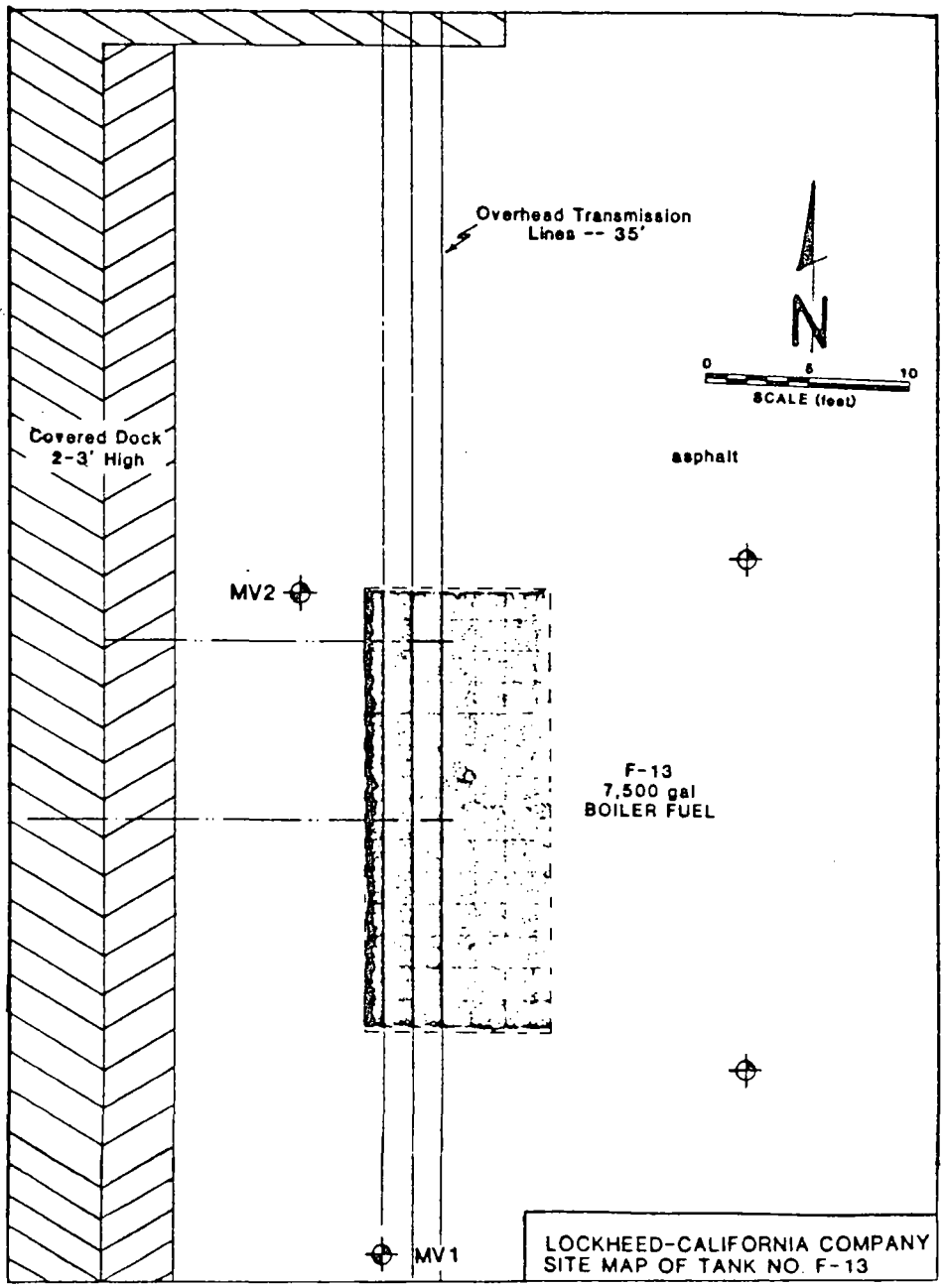
CONCLUSIONS

Based upon field observations and laboratory analysis, it is concluded that Tank B-1-F13 is not leaking.

RECOMMENDATION

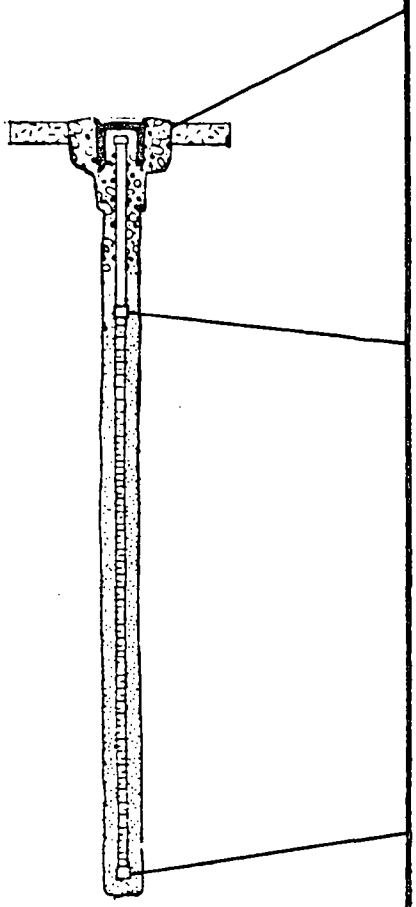
Proceed with quarterly monitoring of the wells.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
F-13


Overhead Transmission
Lines -- 35'
N
0
5
10
SCALE (feet)
Covered Dock
2-3' High
asphalt
MV2
F-13
7,500 gal
BOILER FUEL
MV1
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. F-13

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		F-13
Plant No./Nearest Bldg.		B-1/Bldg. U33A (E Side)
Tank:	Location	1903 Empire Avenue
	Installation Date	UNK
	Capacity, gal.	7,500
	Use/Process	Boiler fuel
	Contents (past,CAS No.,date)	Diesel #2 Boiler 68334305
	(present,CAS No.)	Diesel #2 Boiler 68334305
	Construction Materials	Steel
	Geometry	Cylindrical
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	9.5 ft
	Length (1)	20 ft
	Containment	None
	Corrosive Protection (2)	None
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	2
	Samples Depths	MV1/12 ft MV2/12 ft
	Completion Interval	MV1/5-12.5 ft MV2/5-12 ft
Laboratory Program (4)		
	No. of Tank Contents Samples	0
	Parameters	
	No. of Tank Soil Samples	2
	Parameters	Hydrocarbons

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		35	-Asphalt -Sand,very fine grain, dark brown, -Sand,fine grain, light brown

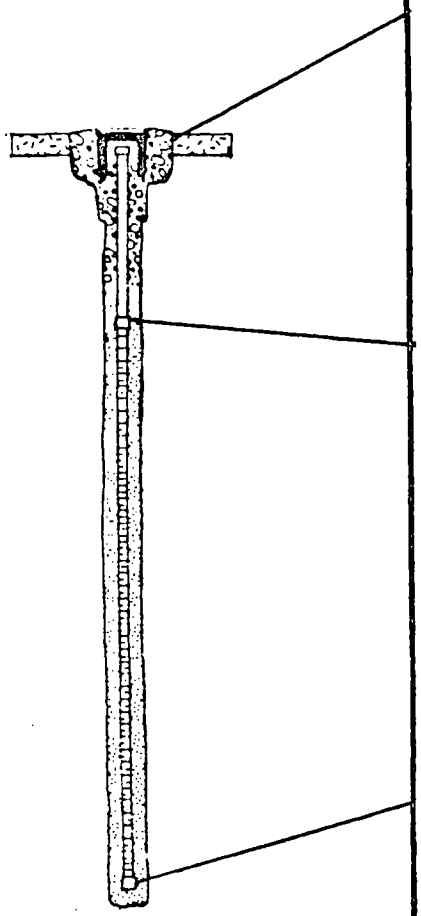
COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-5 ft
-Screened 2-in I.D. PVC pipe, 5-12.5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-13 ft

TANK NO. B-1-F13

MONITORING WELL NO. B-1-F13-MV1

GREGG & ASSOCIATES, INC.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		37	-Asphalt 0-0.6 ft -Artificial Fill: Gravel -Asphalt at 1-1.6 ft -Sand,medium grain,brown -Sand,medium grain,light brown -Sand,medium to coarse grain,light brown

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-5 ft
-Screened 2-in I.D. PVC pipe, 5-12 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-13 ft

TANK NO. B-1-F13

MONITORING WELL NO. B-1-F13-MV2

GREGG & ASSOCIATES, INC.

TABLE B-1-F13: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-F13 MW1 + MW2 COMPOSITE
Volatile Organics (ug/kg)		N.A.	N.T.
Benzene	<0.2		
Ethyl Benzene	<0.1		
Chloroform	<0.1		
Chloromethane	<0.2		
Chloroethane	<0.8		
1,1-Dichloroethane	<0.1		
1,2-Dichloroethane	<0.1		
1,2-Dichloropropane	<0.1		
1,1,1-Trichlorethane	<0.2		
1,1,2-Trichloroethane	<0.1		
Bromodichloromethane	<0.1		
Dibromochloromethane	<0.1		
1,1-Dichloroethene	<0.1		
trans-1,2-Dichloroethene	<0.1		
Trichloroethene	<0.3	* 2,040	
Tetrachloroethene	<0.4		
Toluene	<0.4		
Methyl Ethyl Ketone	<0.5		
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	<2.0
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.
CAM Metals (mg/kg)			N.T.
Antimony	<2.5	500	
Arsenic	13.4	500	
Barium	91.9	10,000	
Beryllium	<1.0	75	
Cadmium	<2.5	100	
Chromium (Total)	9.6	2,500	
Cobalt	6.5	8,000	
Copper	22.1	250	
Lead	<2.5	1,000	
Mercury	<0.1	20	
Molybdenum	6.3	3,500	
Nickel	8.4	2,000	
Selenium	<2.5	100	
Silver	<2.5	500	
Thallium	<2.5	700	
Vanadium	22.0	2,400	
Zinc	38.7	2,500	
Others			N.T.
pH (standard units)	8.24	N.A.	
Sodium (mg/kg)	N.T.	N.A.	
Cyanide (mg/kg)	<0.2	N.A.	
Sulfate (mg/kg)	N.T.	N.A.	

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-F14

FIELD PROGRAM

One boring and two vapor monitoring wells were drilled/installed to monitor subsurface conditions at Tank B-1-F14. The original work plan called for two 12 foot vapor monitoring wells, however, because of the contaminated conditions at the western most well, drilling was continued to a depth of 40 feet to further delineate the extent of contamination.

VAPOR MONITORING WELL B-1-F14-MV1

Monitoring Installations - Boring/Vapor Monitoring Well B-1-F14-MV1 was drilled/installed to monitor the diesel tank slightly north and west of the approved location. Both the actual and approved locations of the boring/vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples were taken from the boring/vapor monitoring well at a depth of 12, 25, and 40 feet. The 12 foot sample was taken at the depth approved in the work plan. Additional samples at 25 and 40 feet were extracted to help quantify the contaminate levels with depth.

Field Observations - The medium to coarse grain size of the sand remained predominate throughout the first 6 feet of the boring/vapor monitoring well. There were, however, layer of darker finer sand interspersed within the upper 6 feet. At 6 feet the sand became finer, and the color became darker. The frequency of cobbles increased at 20 feet and continued to 22 feet. At 30 feet the cobbles again became prevalent. The soil was light brown in color throughout the first 6 feet. From 6 to 9 feet the color changed from brown to light brown. At 9 feet there soil became grey and continued that color to a depth of 25 feet. At 25 feet the soil returned to a brown color. The grey color seems to correspond with the most heavily contaminated zone.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. The soil at 9 feet to 25 feet had a strong odor indicating possible contamination. The odor dissipated greatly at 25 feet although a slight odor persisted to 40 feet. The vapors from the excavation were measured in the breathing zone, with an HNU PID meter. At 12 feet, the HNU readings averaged 10 ppm. The possibility of contamination of the soil was sufficient to warrant placing the auger cutttings in a 55-gallon drum approved for storage of hazardous waste.

VAPOR MONITORING WELL B-1-F14-MV2

Monitoring Installations - Vapor Monitoring Well B-1-F14-MV2 was installed to monitor the diesel tank east of the approved location due reassessment of the tank's orientation. Both the actual and approved locations of the vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at a depth of 12 feet, as approved in the Work Plan.

Field Observations - The medium to fine grain size of the sand remained predominate throughout the vapor monitoring well. There were lenses of coarse sand interspersed within the fine to medium sand. The frequency of cobbles increased at 3 feet and continued to 4 feet. The soil was brown throughout the vapor monitoring well.

There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Samples were collected from Vapor Monitoring Wells B-1-F14-MV1 and B-1-F14-MV2. Based on field observations which indicate the possible presence of volatile organics, individual depth samples collected from B-1-F14-MV1 were analyzed for petroleum hydrocarbons and oil and grease. In addition, a composite of these samples was analyzed for volatile organics. An individual depth sample was collected from MV2 at a depth of 17 feet and was analyzed for petroleum hydrocarbons and oil and grease. These analyses were in accordance with the work plan.

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-F14. High concentrations of petroleum hydrocarbons (130 mg/kg) and oil and grease (130 mg/kg) were reported in the 12 foot sample taken from B-1-F14-MV1. The 25 foot and 40 foot samples taken from MV1 were found to contain petroleum hydrocarbon and oil and grease levels below the limit of detection. The levels of volatile organic compounds in the composited MV1 sample were reported to be below the limit of detection. A moderate level of petroleum hydrocarbons (16 mg/kg) and oil and grease was found in the sample collected from B-1-F14-MV2.

CONCLUSIONS

Based on the field observations and laboratory analyses, it is concluded that it is probable that Tank B-1-F14 is leaking. As the bottom of the tank lies at a depth of about 10 feet, it is

possible that the hydrocarbon contamination found at the 12-foot depth in MV1 and at the 17-foot depth in MV2 is due to tank leakage. However, the contamination may also be due to surface spills.

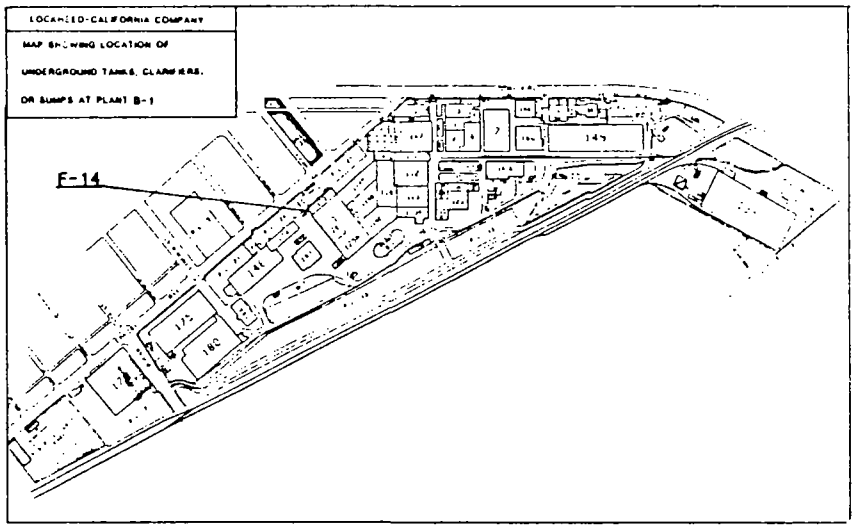
RECOMMENDATION

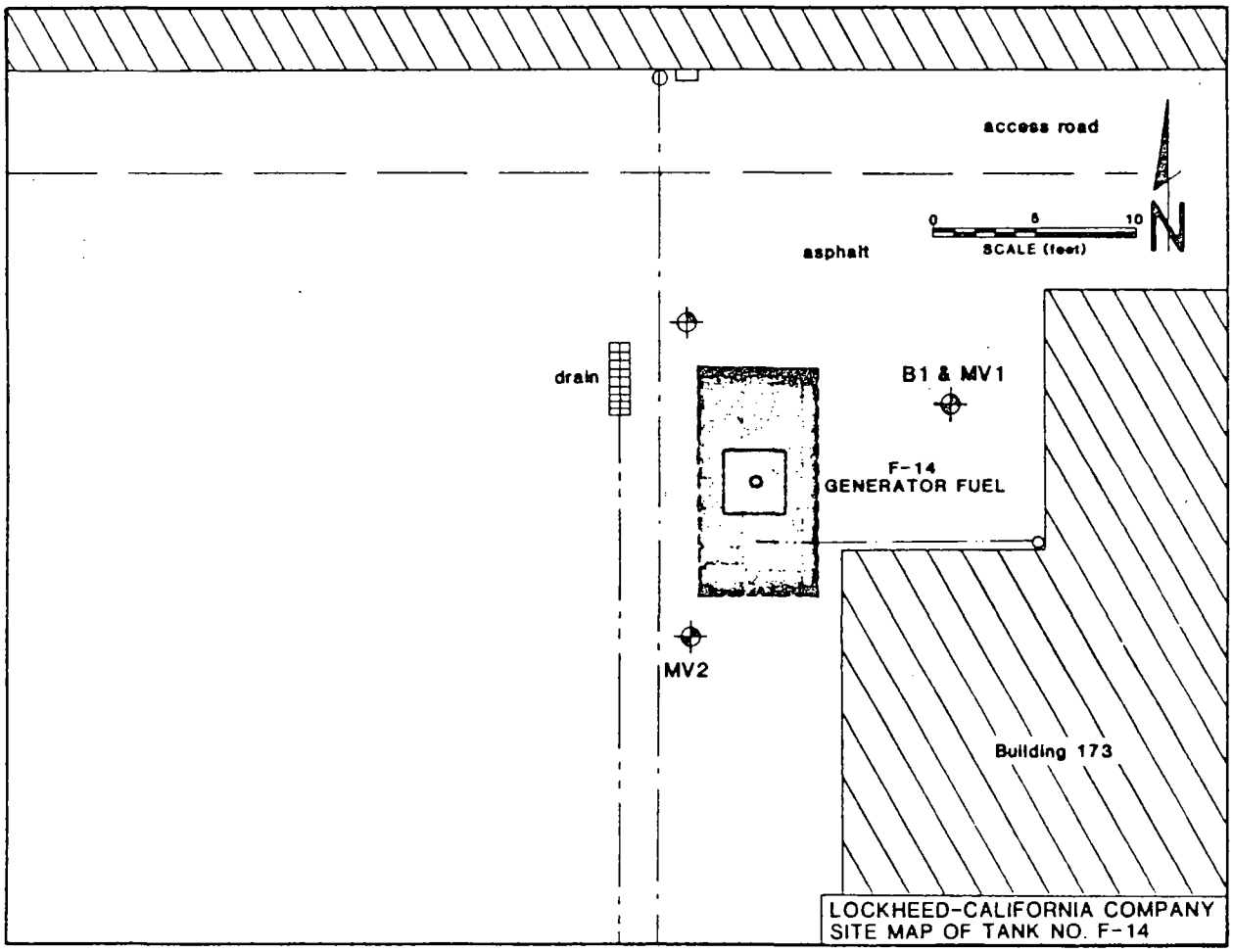
A tank integrity test should be conducted on Tank B-1-F14. Depending on the results of this test, additional subsurface sampling and analysis may be necessary to further determine whether the origin of the contamination is from the leakage of the tank and to quantify the extent of contamination.

TANK NUMBER B-1-F14 supplement

FURTHER RECOMMENDATIONS

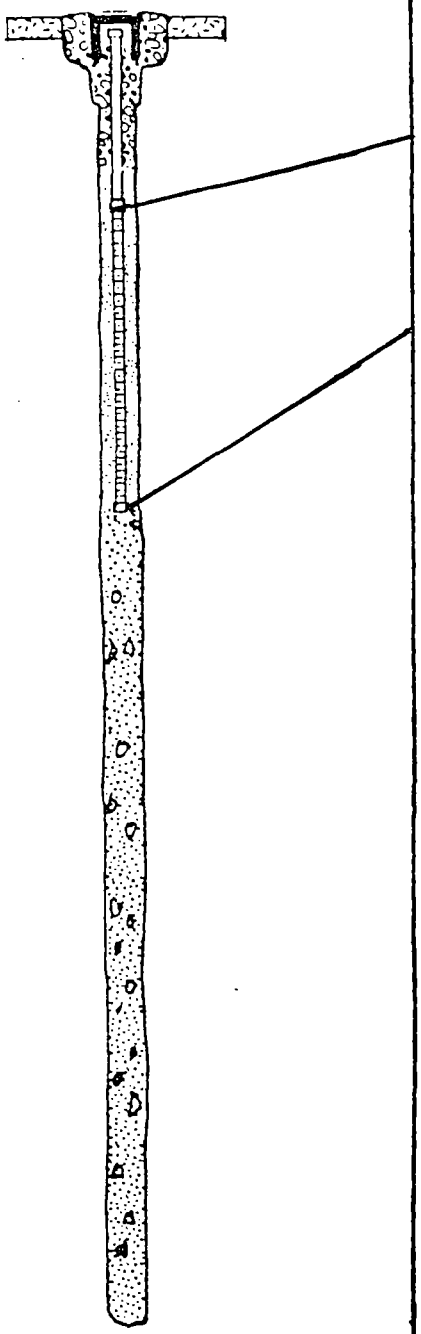
The analysis of soil samples collected near Tank B-1-F14 during the initial drilling indicated moderate levels of petroleum hydrocarbons near one end of Tank B-1-F14. Because leakage from Tank B-1-F14 is a possible source of this contamination, and because the tank is now unused; it has been slated for permanent abandonment. The abandonment will be completed under supervision of the City of Burbank Fire Department and tank closure guidelines. This closure will likely involve steamcleaning the inside of the tank, pumping the rinse water out and filling the tank with a lean mixture of concrete and sand.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
F-14


access road
asphalt
0
5
10
SCALE (feet)
N
drain
B1 & MV1
F-14
GENERATOR FUEL
MV2
Building 173
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. F-14

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		F-14
Plant No./Nearest Bldg.		B-17/Bldg. 375 (NW Corner)
Tank:	Location	1403 Empire Avenue
	Installation Date	UNK
	Capacity, gal.	UNK
	use/Process	Generator fuel
	Contents (past,CAS No.,date)	UNK
	(present,CAS No.)	Diesel #2 Boiler 68334035
	Construction Materials	Steel
	Geometry	Cylindrical
	Depth to Top	4.5 ft
	Depth to Invert	9.5 ft
	Diameter	5.5 ft
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	UNK
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving material/thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger, To be abandoned
	Borings (No.)	1
	Sample Depths	81/12,25,40 ft
	Vapor Wells/Lysimeter (No.)	2
	Samples Depths	MW1/REF. TO BE MW2/12 ft
	Completion Interval	MW1/4-9.5 ft MW2/5-11.5 ft
Laboratory Program (4)		
	No. of Tank Contents Samples	0
	Parameters	
	No. of Tank Soil Samples	4 & 1(Dup.)
	Parameters	Hydrocarbons Vol.Org.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			-Asphalt, 10-in thick
	- 2 -			-Sand, medium to coarse grain, brown to variegated brown, abundant cobbles
	- 4 -			
	- 6 -			-Slightly darker & finer w/cobbles 1 to 4-in diameter
	- 8 -			
	- 10 -			-Color change to gray strong diesel odor
	- 12 -		45	
	- 14 -			
	- 16 -			
	- 18 -			
	- 20 -			-Cobbles, strong odor continues
	- 22 -			
	- 24 -			
	- 26 -		40	-Odor diminished color change to brown
	- 28 -			
	- 30 -			-Cobbles, slight odor
	- 32 -			
	- 34 -			
	- 36 -			
	- 38 -			
	- 40 -		50	-Continued slight odor

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-4 ft
-Screened 2-in I.D. PVC pipe, 4-9.8 ft
-Concrete, 0-3 ft
-Bentonite, 3-4 ft
-Clean sand, 4-18 ft
-Native material, caved 18-40 ft

TANK NO. B-1-F14

BORING NO. B-1-F14-MV1

GREGG & ASSOCIATES, INC.

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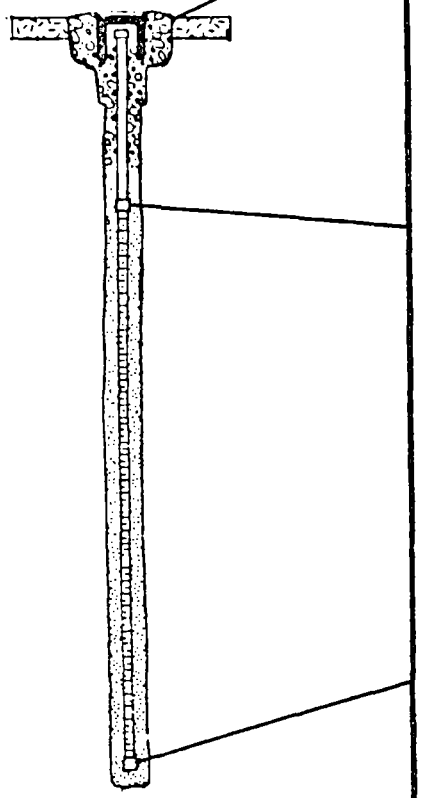
CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		50+	-Asphalt, 8-in thick -Sand, fine to medium grain, brown, w/lenses of very coarse & moist, -Abundant cobbles

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-5 ft
-Screened 2-in I.D. PVC pipe, 5-11.8 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-12 ft

TANK NO. B-1-F14

MONITORING WELL NO. B-1-F14-MV2

GREGG & ASSOCIATES, INC.

TABLE B-1-F14: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-F14 MV1 12 ft.	B-1-F14 MV1 25 ft.	B-1-F14 MV1 40 ft.	B-1-F14 MV1 COMPOSITE	B-1-F14 MV2 12 ft.
Volatile Organics (ug/kg)		N.A.	N.T.	N.T.	N.T.	N.D.	N.T.
Benzene	<0.2						
Ethyl Benzene	<0.1						
Chloroform	<0.1						
Chloromethane	<0.2						
Chloroethane	<0.8						
1,1-Dichloroethane	<0.1						
1,2-Dichloroethane	<0.1						
1,2-Dichloropropane	<0.1						
1,1,1-Trichlorethane	<0.2						
1,1,2-Trichloroethane	<0.1						
Bromodichloromethane	<0.1						
Dibromochloromethane	<0.1						
1,1-Dichloroethene	<0.1						
trans-1,2-Dichloroethene	<0.1						
Trichloroethene	<0.3	* 2,040					
Tetrachloroethene	<0.4						
Toluene	<0.4						
Methyl Ethyl Ketone	<0.5						
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	130	<2.0	<2.0	N.T.	16
Oil & Grease (mg/kg)	N.T.	N.A.	130	<2.0	<2.0	N.T.	16
CAM Metals (mg/kg)			N.T.	N.T.	N.T.	N.T.	N.T.
Antimony	<2.5	500					
Arsenic	13.4	500					
Barium	91.9	10,000					
Beryllium	<1.0	75					
Cadmium	<2.5	100					
Chromium (Total)	9.6	2,500					
Cobalt	6.5	8,000					
Copper	22.1	250					
Lead	<2.5	1,000					
Mercury	<0.1	20					
Molybdenum	6.3	3,500					
Nickel	8.4	2,000					
Selenium	<2.5	100					
Silver	<2.5	500					
Thallium	<2.5	700					
Vanadium	22.0	2,400					
Zinc	38.7	2,500					
Others			N.T.	N.T.	N.T.	N.T.	N.T.
pH (standard units)	8.24	N.A.					
Sodium (mg/kg)	N.T.	N.A.					
Cyanide (mg/kg)	<0.2	N.A.					
Sulfate (mg/kg)	N.T.	N.A.					

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

APPENDIX B

NON-FUEL TANKS

LEGEND

SUMP WITH PUMP-OUT PORT 

3 STAGE CLARIFIER 

TANK LOCATION 

BUILDING OR LARGE PERMANENT STRUCTURE 

ABOVE GROUND PIPING 

UNDERGROUND UTILITIES:

—— —— ELECTRIC LINE

—— - —— WATER PIPE

— -- — SEWER PIPE

—v— —v— NATURAL GAS LINE

——··—— TANK PIPING

——·—— UNIDENTIFIED PIPING

—— —— COMPRESSED AIR

PROGRAM ACTIVITIES: AS PLANNED

 40-FOOT SOIL BORING

 VAPOR MONITORING WELL

 SUCTION LYSIMETER

AS COMPLETED

 40-FOOT SOIL BORING

 VAPOR MONITORING WELL

 SUCTION LYSIMETER

 VAPOR MONITORING WELL/SUCTION LYSIMETER

0837

LEGEND

SUMP WITH PUMP-OUT PORT 

3 STAGE CLARIFIER 

TANK LOCATION 

BUILDING OR LARGE PERMANENT STRUCTURE 

ABOVE GROUND PIPING 

UNDERGROUND UTILITIES:

ELECTRIC LINE

WATER PIPE

SEWER PIPE

NATURAL GAS LINE

TANK PIPING

UNIDENTIFIED PIPING

COMPRESSED AIR

PROGRAM ACTIVITIES: AS PLANNED

40-FOOT SOIL BORING

VAPOR MONITORING WELL

SUCTION LYSIMETER

AS COMPLETED

40-FOOT SOIL BORING

VAPOR MONITORING WELL

SUCTION LYSIMETER

TANK NUMBER B-1-C

FIELD PROGRAM

One boring, which upon completion was converted to a suction lysimeter, was drilled/installed to monitor subsurface conditions at Tank B-1-C.

Monitoring Installation - Boring B-1-C-B1/Suction Lysimeter B-1-C-SL1 was drilled/installed to monitor the process waste tank slightly east of the approved location because it was possible to drill closer to the tank than what was originally anticipated. Both the actual and the approved locations of the boring/suction lysimeter are indicated on the site map.

Sampling Intervals - Soil samples were taken from the borehole at depths of 8, 17, 22, 30 and 40 feet, as approved in the Work Plan.

Field Observations - The brown color and the medium-to-coarse grain size of the sand remained consistent throughout the first 17 feet of the boring/suction lysimeter. At 17 feet the sand became variegated light brown and the grain size became coarser. The frequency of cobbles decreased at 10 feet.
Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Samples were collected from Boring B-1-C-B1, and a composite of the samples was analyzed for volatile organics, petroleum hydrocarbons, CAM metals, and pH.

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-C. A high level of acetone (295 ug/kg) was detected for the composite sample. The concentrations of the remaining volatile organic compounds, petroleum hydrocarbons, CAM metals, and pH were all below the limits of detection or near the concentrations reported for the background samples.

CONCLUSIONS

A high level of acetone has been reported for the composite sample collected from Boring B-1-C-B1. Since records indicate that Tank B-1-C is currently used (and has been used in the past) to clean tools with dilute sodium hydroxide, it is unlikely that the acetone came from the tank.

RECOMMENDATION

Additional sampling and depth-specific analyses should be conducted to determine if the high level of acetone is present throughout the soil profile or near the surface. If the results of these analyses suggest that Tank B-1-C is leaking, a tank integrity test and additional sampling and analysis will be required to determine the source of the acetone contamination.

TANK NUMBER B-1-C supplement

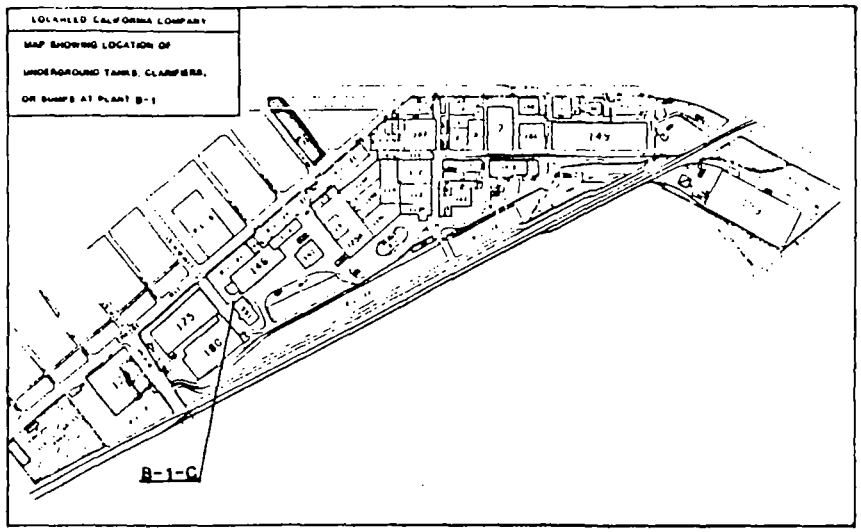
ADDITIONAL INVESTIGATIONS

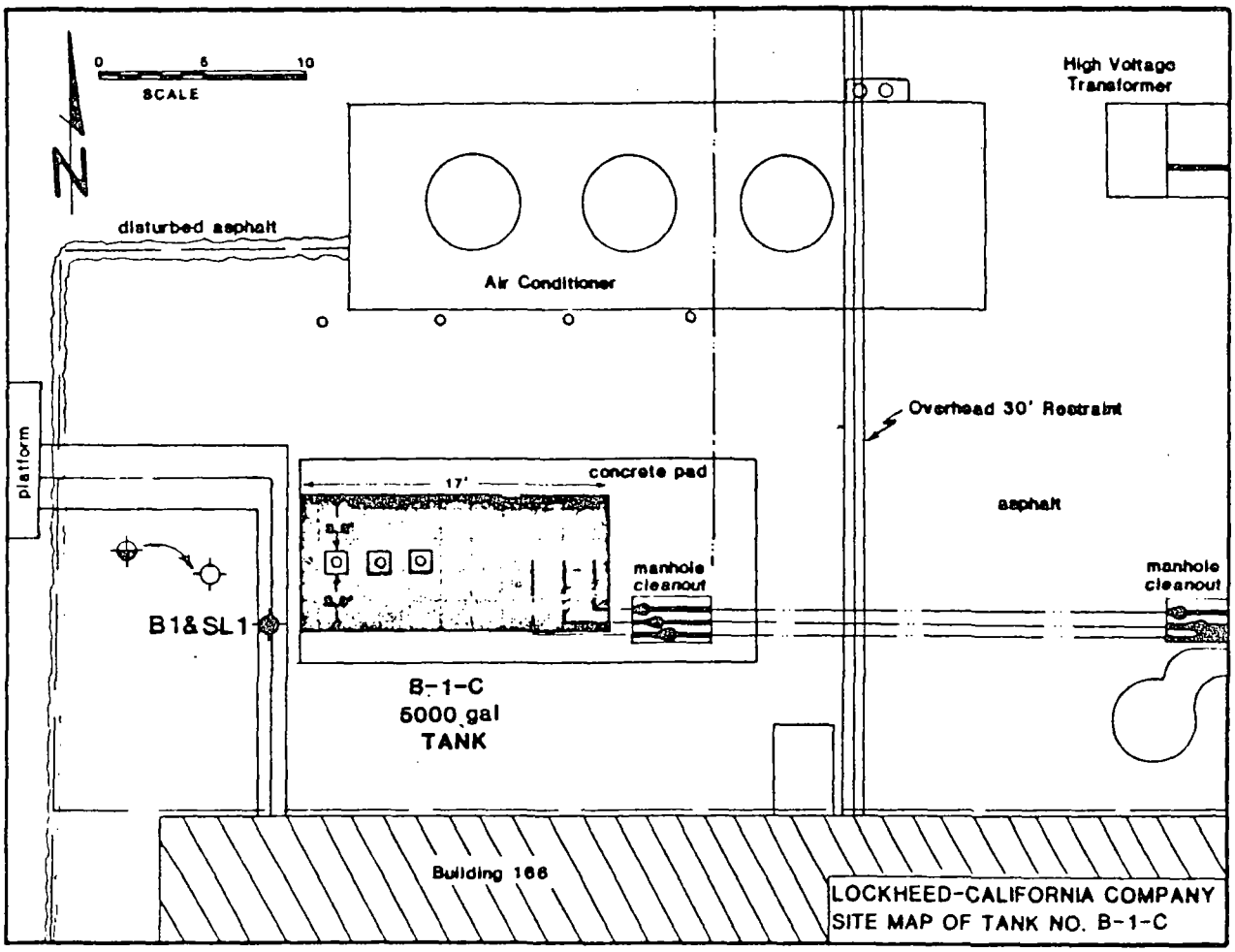
Analysis of soil samples collected near Tank B-1-C during the initial drilling indicated high concentrations of acetone. To determine if the concentration in the soil is the result of tank leakage, Tank B-1-C was hydrostatically tested by Horner Creative Metals, Inc. of Kawkawlin Michigan, on May 31, 1985. The test is a hydrostatic evaluation and can detect leaks in tanks and related piping systems with a level of detection of ±0.05 gallons per hour which is equivalent to the loss of one gallon per day. This is the required level of detection according to National Fire Prevention Authority (N.F.P.A.) #329. The results of the test (Appendix C) indicate that the tank is "certified tight" as is, not leaking within the accepted level of detection.

It is therefore concluded that the contamination present in the nearby soil is not the result of leakage from Tank B-1-C. The contamination may be the result of periodic overfilling of the tank or fugative surface spillage of other materials.

FURTHER RECOMMENDATIONS

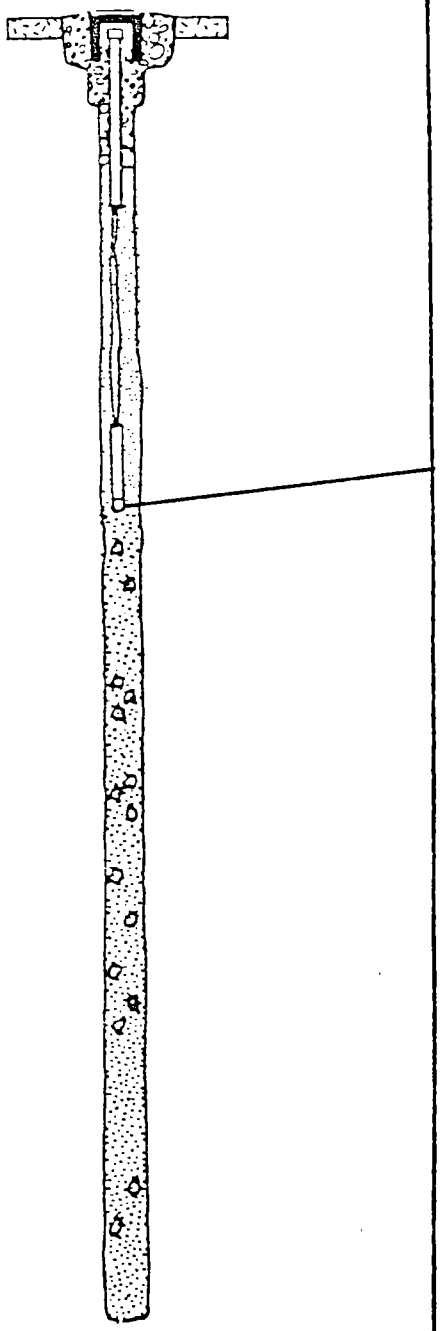
Because the exact source of the contamination cannot, at this time, be determined and since additional sampling probably would not clarify the matter, it is recommended that the vapor monitoring well installed near the tank be closely monitored over the next few months. The well should be sampled with a gas collection device, such as a tenex tube and analyzed for volatile organics. This test should be repeated after approximately two months and the results of the test compared. These analyses should indicate the need, if any, for further charaterization of this site.


LOCKHEED CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-C


0 5 10
SCALE
N
High Voltage Transformer
disturbed asphalt
Air Conditioner
Overhead 30' Restraint
platform
17'
concrete pad
asphalt
manhole cleanout
manhole cleanout
B1&SL1
B-1-C
5000 gal
TANK
Building 166
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-C

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-C
Plant No./Nearest Bldg.		B-1/Bldg. 130 in Side
Tank:	Location	1705 Victory Place
	Installation Date	1977
	Capacity, gal.	5,000
	Use/Process	Tool cleaning waste
	Contents (past,EAS No.,Date)	Dilute sodium hydroxide 1319732
	(present,EAS No.)	Dilute Sodium Hydroxide 1319732
	Construction Materials	Mild Steel
	Geometry	Cylindrical
	Depth to Top	5 ft
	Depth To Invert	12 ft
	Diameter	7 ft
	Length (1)	17 ft
	Containment	None
	Corrosive Protection (2)	ext.coated
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S.Auger, Integrity test
	Borings (No.)	1
	Sample Depths	@1/8,17,22,30,40 ft
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	SL1/REF. TO Bt
	Completion Interval	SL1/14 ft
Laboratory Program (4)		
	No. of Tank Content Samples	1 (Comp.)
	Parameters	
	No. of Tank Soil Samples	1(Comp.)
	Parameters	Other as Req'd

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		50+ 50+ 50+ 50+	-Asphalt -Sand,medium to coarse grain,brown to variegated,moist,loose -Frequent cobbles,sub-rounded -Sand,coarse grain, variegated,w/pea size gravel

COMPLETION & BACKFILL

-Suction Lysimeter at 14 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-13 ft
-Native sand & silica sand mix, 13-15 ft
-Native material, backfill 15-40 ft

TANK NO. B-1-C

BORING NO. B-1-C-B1

GREGG & ASSOCIATES, INC.

TABLE B-1-C: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-C B1 COMPOSITE
Volatile Organics (ug/kg)		N.A.	
Benzene	<0.2		N.D.
Ethyl Benzene	<0.1		N.D.
Chloroform	<0.1		N.D.
Chloromethane	<0.2		N.D.
Chloroethane	<0.8		N.D.
1,1-Dichloroethane	<0.1		N.D.
1,2-Dichloroethane	<0.1		N.D.
1,2-Dichloropropane	<0.1		N.D.
1,1,1-Trichlorethane	<0.2		N.D.
1,1,2-Trichloroethane	<0.1		N.D.
Bromodichloromethane	<0.1		N.D.
Dibromochloromethane	<0.1		N.D.
1,1-Dichloroethene	<0.1		N.D.
trans-1,2-Dichloroethene	<0.1		N.D.
Trichloroethene	<0.3	* 2,040	N.D.
Tetrachloroethene	<0.4		N.D.
Toluene	<0.4		N.D.
Acetone	<25.0		295
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	<2.0
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.
CAM Metals (mg/kg)			
Antimony	<2.5	500	<2.5
Arsenic	13.4	500	11.2
Barium	91.9	10,000	57.6
Beryllium	<1.0	75	<1.0
Cadmium	<2.5	100	<0.5
Chromium (Total)	9.6	2,500	6.8
Cobalt	6.5	8,000	6.5
Copper	22.1	250	12.0
Lead	<2.5	1,000	<2.5
Mercury	<0.1	20	<0.1
Molybdenum	6.3	3,500	<1.0
Nickel	8.4	2,000	5.7
Selenium	<2.5	100	<2.5
Silver	<2.5	500	<2.5
Thallium	<2.5	700	<2.5
Vanadium	22.0	2,400	18.5
Zinc	38.7	2,500	23.9
Others			
pH (standard units)	8.24	N.A.	8.07
Sodium (mg/kg)	403	N.A.	N.T.
Cyanide (mg/kg)	<0.2	N.A.	N.T.
Sulfate (mg/kg)	<6	N.A.	N.T.

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-H

FIELD PROGRAM

One boring, which upon completion was converted to a vapor monitoring well was drilled/installed to monitor subsurface conditions at Tank B-1-H. Also, due to the proximity of Tank B-1-H to Tank B-1-I, a boring/vapor monitoring well near the west end of B-1-I monitors both tanks.

Monitoring Installation - Boring/Vapor Monitoring Well B-1-H-B1 was drilled/installed to monitor the waste oil tank south and east of the approved location so that coverage of the east end of the tank could be achieved as west end coverage is supplied by B-1-I. Both the actual and the approved locations of the boring/vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples from the boring/vapor monitoring well were to have been collected at depths of 6, 13, 18, 28 and 40 feet, according to the work plan. however, to expedite the sampling process the samples were shifted to intervals of 5, 15, 20, 30 and 40 feet. Based on the absence of any layers of low permeability in the upper portions of the soil horizons, and the loose, highly conductive nature of the sands that predominate the lithology, it is unlikely that a slight variance in the sampled intervals will significantly alter the chemical profile of the soil.

Field Observations - The medium to coarse grain size of the sand remained predominant throughout the first 38 feet of the boring/vapor monitoring well. There were layers of finer, darker sand occasionally intersperced within the medium to coarse sand. At 38 feet the sand became very fine, almost silt sized. The upper 10 feet of the hole contained soil of brown and occasionally dark brown color. At 10 feet the soil became lighter brown. The occurrence of gravel and cobbles remained sporadic throughout the boring.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination other than the slightly discolored sand in the upper 10 feet of the boring.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - A liquid sample of the contents of Tank B-1-H was collected and analyzed for oil and grease. Soil samples collected from Boring B-1-H-B1, were composited and analyzed for petroleum hydrocarbons. These analyses were in accordance with the work plan.

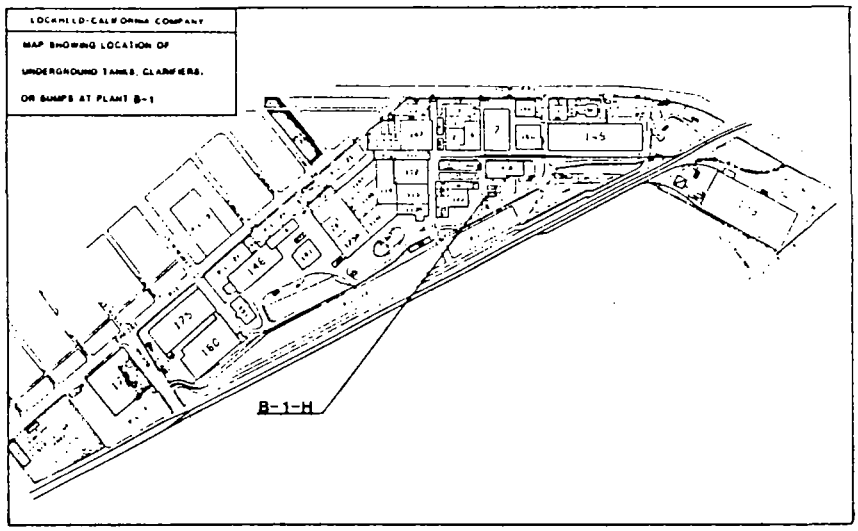
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-H. The liquid sample was found to contain an oil and grease concentration of 896 mg/kg. The concentration of petroleum hydrocarbons in the composite soil sample was reported to be below the limit of detection.

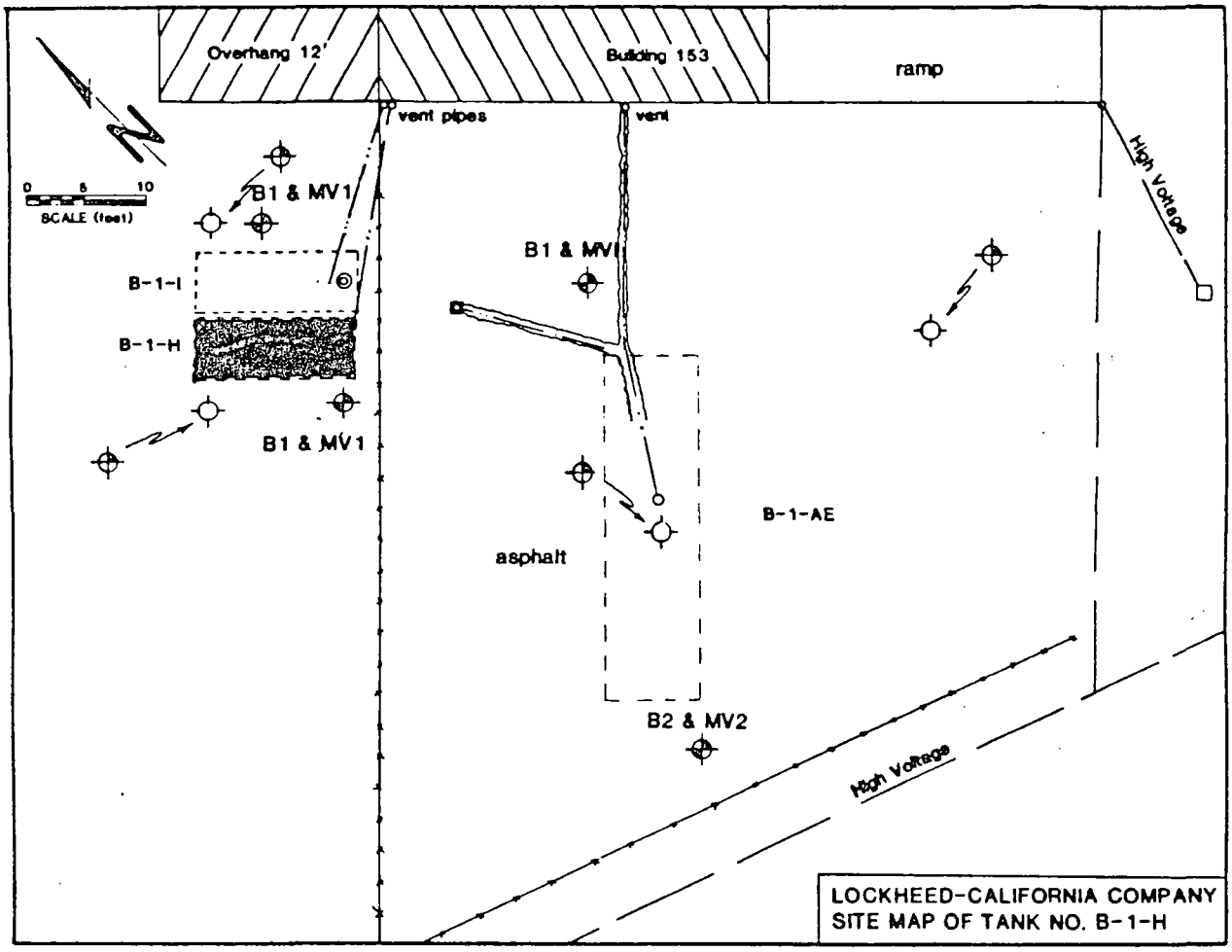
CONCLUSIONS

Based upon field observations and laboratory analysis, it is concluded that Tank B-1-H is not leaking.

RECOMMENDATION

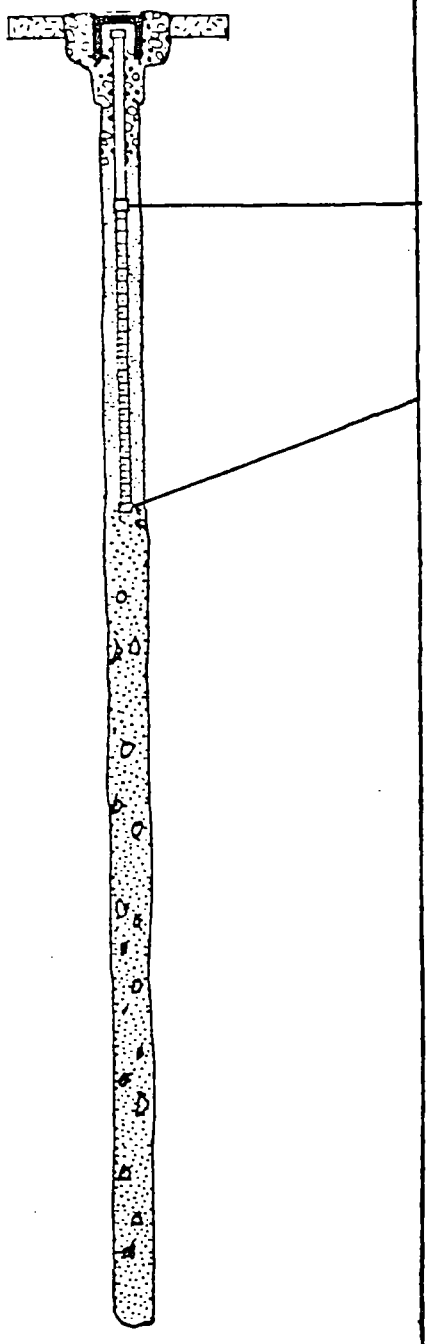
Proceed with quarterly monitoring of the wells.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-H


Overhang 12'
Building 153
ramp
vent pipes
vent
High Voltage
N
0 5 10
SCALE (feet)
B1 & MV1
B-1-I
B-1-H
B1 & MV1
B1 & MV1
B-1-AE
asphalt
B2 & MV2
High Voltage
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-H

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-H
Plant No./Nearest Bldg.		B-1/Bldg. 153 (SW Corner)
Tank:	Location	1705 Victory Place
	Installation Date	
	Capacity, gal.	2,000
	Use/Process	UNK
	Contents (past,CAS No.,date)	UNK
	(present,CAS No.)	Spent soluble oil, machine coolant 68334305
	Construction Materials	Mild Steel
	Geometry	Cylindrical
	Depth To Top	4 ft
	Depth To Invert	8 ft
	Diameter	4 ft
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Int. Coated/Ext. Painted
	Status	UNK
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	Poor
	Surface Contamination	Area Covered With Oil
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger
	Borings (No.)	1
	Sample Depths	B1/5,15,20,30,40 ft
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	MV1/REF. TO B1
	Completion Interval	MV1/6-12 ft
Laboratory Program (4)	No. of Tank Content Samples	1
	Parameters	Hydrocarbons
	No. of Tank Soil Samples	1(Comp.)
	Parameters	Hydrocarbons

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		9 40 50+ 50+ 25	-Asphalt -Sand,medium to coarse grain,brown,moist, w/peagravel & frequent small cobbles -More fine,loose,fewer cobbles & gravel, back to coarse at 6 ft -Sand,coarse grain,light brown, w/some peagravel -Cobbles -Color change to dark brown -Sand,silty,loose

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-6 ft
-Screened 2-in I.D. PVC pipe, 6-12 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-18 ft
-Native material, caved 18-40 ft

TANK NO. B-1-H

BORING NO. B-1-H-B1

GREGG & ASSOCIATES, INC.

TABLE B-1-H: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-H LIQUID UNTREATED	B-1-H B1 COMPOSITE
Volatile Organics (ug/kg)		N.A.	N.T.	N.T.
Benzene	<0.2			
Ethyl Benzene	<0.1			
Chloroform	<0.1			
Chloromethane	<0.2			
Chloroethane	<0.8			
1,1-Dichloroethane	<0.1			
1,2-Dichloroethane	<0.1			
1,2-Dichloropropane	<0.1			
1,1,1-Trichlorethane	<0.2			
1,1,2-Trichloroethane	<0.1			
Bromodichloromethane	<0.1			
Dibromochloromethane	<0.1			
1,1-Dichloroethene	<0.1			
trans-1,2-Dichloroethene	<0.1			
Trichloroethene	<0.3	* 2,040		
Tetrachloroethene	<0.4			
Toluene	<0.4			
Methyl Ethyl Ketone	<0.5			
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	<4.0
Oil & Grease (mg/kg)	N.T.	N.A.	896	N.T.
CAM Metals (mg/kg)			N.T.	N.T.
Antimony	<2.5	500		
Arsenic	13.4	500		
Barium	91.9	10,000		
Beryllium	<1.0	75		
Cadmium	<2.5	100		
Chromium (Total)	9.6	2,500		
Cobalt	6.5	8,000		
Copper	22.1	250		
Lead	<2.5	1,000		
Mercury	<0.1	20		
Molybdenum	6.3	3,500		
Nickel	8.4	2,000		
Selenium	<2.5	100		
Silver	<2.5	500		
Thallium	<2.5	700		
Vanadium	22.0	2,400		
Zinc	38.7	2,500		
Others			N.T.	N.T.
pH (standard units)	8.24	N.A.		
Sodium (mg/kg)	N.T.	N.A.		
Cyanide (mg/kg)	<0.2	N.A.		
Sulfate (mg/kg)	N.T.	N.A.		

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION
* mg/kg

TANK NUMBER B-1-I

FIELD PROGRAM

One boring, which upon completion was converted to a vapor monitoring well was drilled/installed to monitor subsurface conditions at Tank B-1-I. The east end of the tank will be monitored by B-1-H-B1/MV1. The west end of the tank is monitored by B-1-I-B1/MV1.

BORING B-1-I-B1

Monitoring Installations - Boring/Vapor Monitoring Well B-1-I-B1/MV1 was drilled/installed to monitor the diesel tank as indicated in the approved work plan. The location of the boring/vapor monitoring well is indicated on the site map.

Sampling Intervals - Soil samples were taken at depths of 5, 15, 20, 30 and 40 feet.

Samples were collected at intervals approved in the work plan except for the 6 foot sample; which was instead, sampled at 5 feet so that the sample process could be expedited.

Field Observations - The brown medium to coarse grain size of the sand remained predominate throughout the first 38 feet of the borehole. There were some thin layers of fine sand interbedded with the medium and coarse sand. At 38 feet the sand became very much finer, with the average grain being very fine or silt size. The brown color of the soil became lighter at 14 feet and continued light brown to 38 feet, where it again became brown. The frequency of cobbles increased at 14 feet and continued to 16 feet.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - A liquid sample of the contents of Tank B-1-I was collected and analyzed for oil and grease. Soil samples were collected from boring B-1-I-B1 and a composite of these samples was analyzed for oil and grease. These analyses have been approved in the work plan.

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-I. The liquid sample was found to

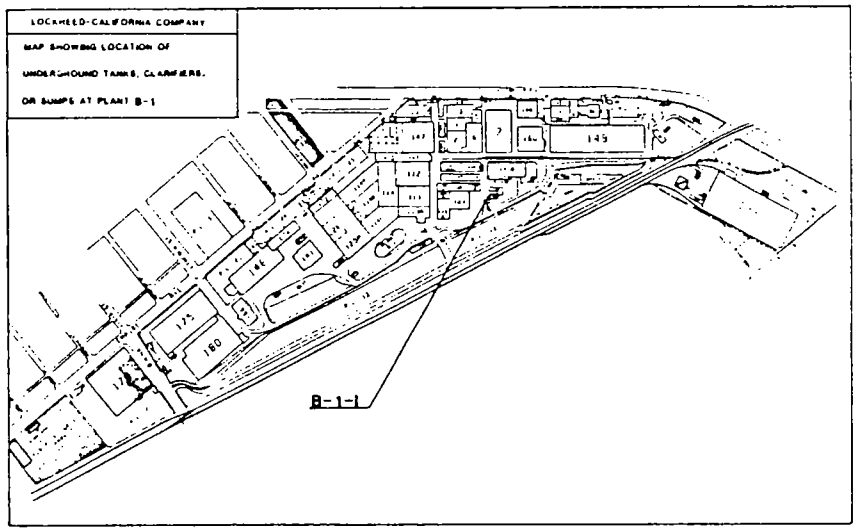
contain 50 percent oil and 50 percent water. The concentration of oil and grease in the composite soil sample was reported to be below the level of detection.

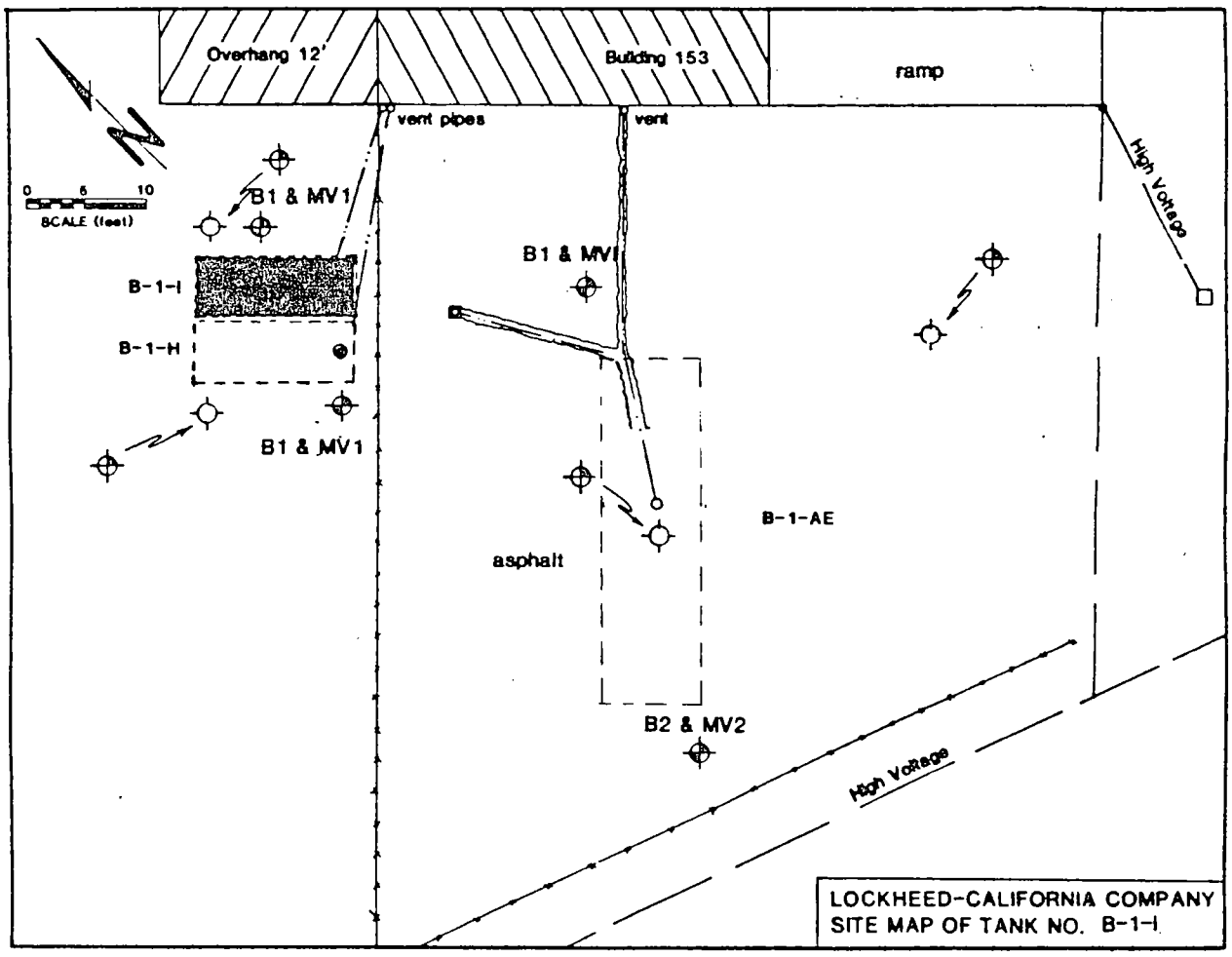
CONCLUSIONS

Based upon field observations and laboratory analysis, it is concluded that Tank B-1-I is not leaking.

RECOMMENDATION

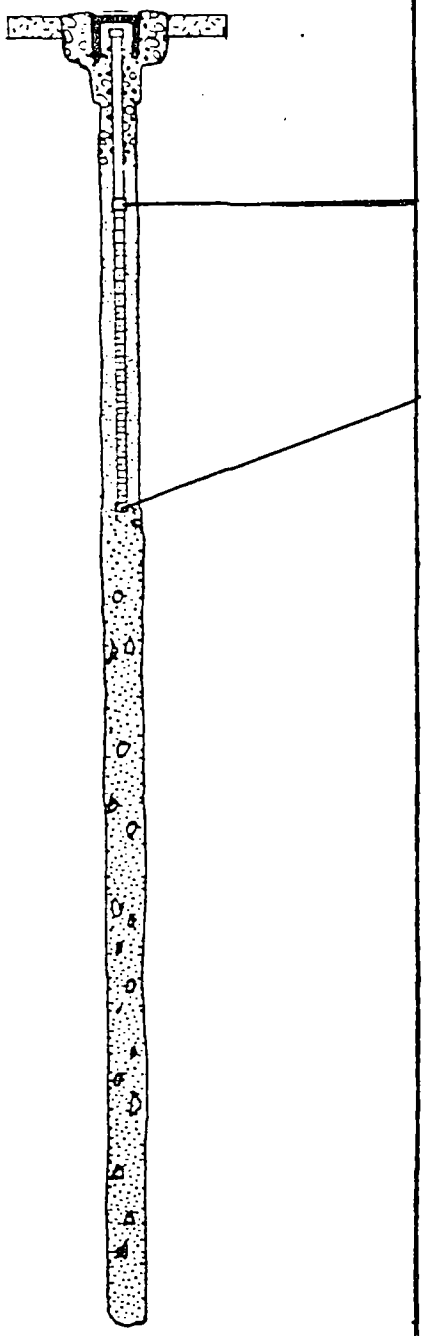
Proceed with quarterly monitoring of the well.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-I


Overhang 12'
Building 153
ramp
vent pipes
vent
High Voltage
0 5 10
SCALE (feet)
B1 & MV1
B-1-I
B-1-H
B1 & MV1
B1 & MV1
B-1-AE
asphalt
B2 & MV2
High Voltage
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-I

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-I
Plant No./Nearest Bldg.		B-1/Bldg. 153 (SW Corner)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	2,000
	Use/Process	UNK
	Contents (past,CAS No.,date)	UNK
	(present,CAS No.)	Spent soluble oil, machine coolant 68334305
	Construction Materials	Mild Steel
	Geometry	Cylindrical
	Depth To Top	4.4 ft
	Depth To Invert	9.4 ft
	Diameter	5 ft
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Int. Coated/Ext. Painted
	Status	UNK
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	Poor
	Surface Contamination	Area covered with oil
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger
	Borings (No.)	1
	Sample Depths	B1/5,15,20,30,40 ft
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	MV1/REF. TO B1
	Completion Interval	MV1/6-12 ft
Laboratory Program (4)		
	No. of Tank Content Samples	1
	Parameters	Hydrocarbons
	No. of Tank Soil Samples	1(Comp.)
	Parameters	Hydrocarbons

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			-Asphalt
	- 2 -			-Sand, medium to coarse grain, brown, moist, loose, abundant cobbles & gravel to 6 ft, some fine grain sand
	- 4 -			
	- 6 -		17	
	- 8 -			
	- 10 -			-Color change, darker brown, increasing fine grain sand
	- 12 -			
	- 14 -			-Cobbles to 14 ft color change to light brown
	- 16 -		35	
	- 18 -			
	- 20 -		50+	-Occasional cobbles
	- 22 -			
	- 24 -			
	- 26 -			
	- 28 -			
	- 30 -		50+	
	- 32 -			
	- 34 -			
	- 36 -			
	- 38 -			-Sand, silty, fine to medium grain, loose
	- 40 -		20	

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-6 ft
-Screened 2-in I.D. PVC pipe, 6-12 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-12 ft
-Native material, caved 12-40 ft

TANK NO. B-1-I

BORING NO. B-1-I-B1

GREGG & ASSOCIATES, INC.

TABLE B-1-I: RESULTS OF CHEMICAL ANALYSES

0837

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-I LIQUID UNTREATED	B-1-I B1 COMPOSITE
Volatile Organics (ug/kg)		N.A.	N.T.	N.T.
Benzene	<0.2			
Ethyl Benzene	<0.1			
Chloroform	<0.1			
Chloromethane	<0.2			
Chloroethane	<0.8			
1,1-Dichloroethane	<0.1			
1,2-Dichloroethane	<0.1			
1,2-Dichloropropane	<0.1			
1,1,1-Trichlorethane	<0.2			
1,1,2-Trichloroethane	<0.1			
Bromodichloromethane	<0.1			
Dibromochloromethane	<0.1			
1,1-Dichloroethene	<0.1			
trans-1,2-Dichloroethene	<0.1			
Trichloroethene	<0.3	* 2,040		
Tetrachloroethene	<0.4			
Toluene	<0.4			
Methyl Ethyl Ketone	<0.5			
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	50%OIL;50%WATER	<4.0
CAM Metals (mg/kg)			N.T.	N.T.
Antimony	<2.5	500		
Arsenic	13.4	500		
Barium	91.9	10,000		
Beryllium	<1.0	75		
Cadmium	<2.5	100		
Chromium (Total)	9.6	2,500		
Cobalt	6.5	8,000		
Copper	22.1	250		
Lead	<2.5	1,000		
Mercury	<0.1	20		
Molybdenum	6.3	3,500		
Nickel	8.4	2,000		
Selenium	<2.5	100		
Silver	<2.5	500		
Thallium	<2.5	700		
Vanadium	22.0	2,400		
Zinc	38.7	2,500		
Others			N.T.	N.T.
pH (standard units)	8.24	N.A.		
Sodium (mg/kg)	N.T.	N.A.		
Cyanide (mg/kg)	<0.2	N.A.		
Sulfate (mg/kg)	N.T.	N.A.		

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION
* mg/kg

TANK NUMBER B-1-J

FIELD PROGRAM

One boring and one vapor monitoring well were drilled/installed to monitor subsurface conditions at Sump B-1-J.

BORING B-1-J-B1

Monitoring Installation - Boring B-1-J-B1 was drilled slightly north and east of the approved monitoring location because it was possible to drill closer to the sump than was originally anticipated. Both the actual and the approved locations of the boring are indicated on the site map.

Sampling Intervals - Soil samples from the boring were to have been collected at depths of 3, 10, 15, 25 and 40 feet according to the work plan. However, because of the contamination present the sample intervals were shifted to 5, 10, 15, 20, 30 and 40 feet. This should facilitate more accurate chemical profiling of the boring.

Field Observations - The medium-to-coarse grain size of the sand remained consistent throughout the first 10 feet of the boring. At 10 feet the sand became predominately finer, and the gravel and cobble fraction decreased, which corresponds to the color change at the same depth. The soil was dark grey in color throughout the first 10 feet. From 10 to 20 feet the color changed from dark grey to variegated light brown.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. The soil from just below the surface to 40 feet had a strong odor indicating contamination. There were also small (0.5 inch) clasts of suspected conchoidally fractured zinc chromate sludge present sporadically throughout the boring. The vapors from soil samples were measured in the headspace of plastics bags with an HNU PID meter. At 5 feet, the HNU readings averaged 30 ppm; at 15 feet, average readings were 41 ppm. At 20 feet, 45 ppm, at 30 feet, 78 ppm and finally, at 40 feet, readings averaged 90 ppm. It must be noted that HNU readings were duplicated with good consistency.

The possibility of contamination of soil was sufficient to warrant placing the auger cuttings in a 55 gallon drum approved for storage of hazardous waste.

VAPOR MONITORING WELL B-1-J-MV1

Monitoring Installation - Vapor Monitoring Well B-1-J-MV1 was installed to monitor the waste oil sump slightly north and east

of the approved location because it was possible to drill closer to the sump than what was originally anticipated. Both the actual and the approved locations of the vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples were taken from the vapor monitoring well at depths of 5 and 12 feet. The 5 foot sample was not scheduled in the initial work plan. It was added because of the contaminated condition of the soil. The well was placed at 12 feet instead of 10 feet as scheduled to extend the coverage beyond the depth of the lithologic change in Boring B-1-J-B1, which is also at 10 feet.

Field Observations - The grey color and medium to coarse grain size of the sand remained consistent throughout the first 7 feet of the vapor monitoring well. At 7 feet the sand became finer, and the color became a lighter grey. This was a large amount of debris throughout the hole. The debris was largely scrap iron and chunks of zinc chromate. The frequency of cobbles increased at 3 feet and continued to 12 feet.

The soil from just below the surface to 12 feet had a strong odor indicating contamination. The vapor from the soil samples were measured in the breathing zone, with an HNU PID meter. At 3 feet, the HNU readings averaged 50 ppm.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - A liquid sample of the contents of Sump B-1-J was collected and analyzed for volatile organics and oil and grease. Based on field observations indicating the possible presence of volatile organics in the soil, samples were collected from Boring B-1-J-B1 and analyzed for volatile organics, petroleum hydrocarbons, and CAM metals. These analyses have been approved in the Work Plan.

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-J. The liquid sample was found to contain 3630 ug/kg of ethyl benzene, 5890 ug/kg of M-Xylene, and 4170 ug/kg of O-P-Xylenes. In addition, the liquid sample was found to be composed of at least 99 percent oil.

The individual depth boring samples were found to contain moderate to high levels of nine volatile organic compounds (ranging from 1.7 ug/kg of 1,2-dichloropropane to 5,810 ug/kg of trans-1,2-dichloroethene). In addition, high levels of petroleum hydrocarbons (ranging from 6,300 to 31,100 mg/kg) were found. Moderate levels of arsenic were also detected in the 5, 10.5, 30.5, and 40.5 foot samples. The arsenic concentrations from these samples ranged from 25.9 to 53.2 mg/kg and are about two to four times the background concentration. However, they are below the acceptable Total Threshold Limit Concentration (500 mg/kg).

Tank B-1-J (continued)

Conclusion - Based on field observations (strong odor) and laboratory results, it is concluded that Sump B-1-J may possibly be leaking. Laboratory results show that high levels of volatile organic compounds and petroleum hydrocarbons were found in the samples collected from B-1-J-B1, indicating that the soils around Sump B-1-J are contaminated. Possible sources of contamination include surface spills, sump overflow, sump leakage, and the possible presence of disposed materials.

Recommendation - Sump inspection and additional sampling and analysis should be conducted to ascertain whether the soil contamination around Sump B-1-J is due to leakage, overflow, surface spills, or to contaminant intrusion from the adjacent dump.

TANK NUMBER B-1-J supplement

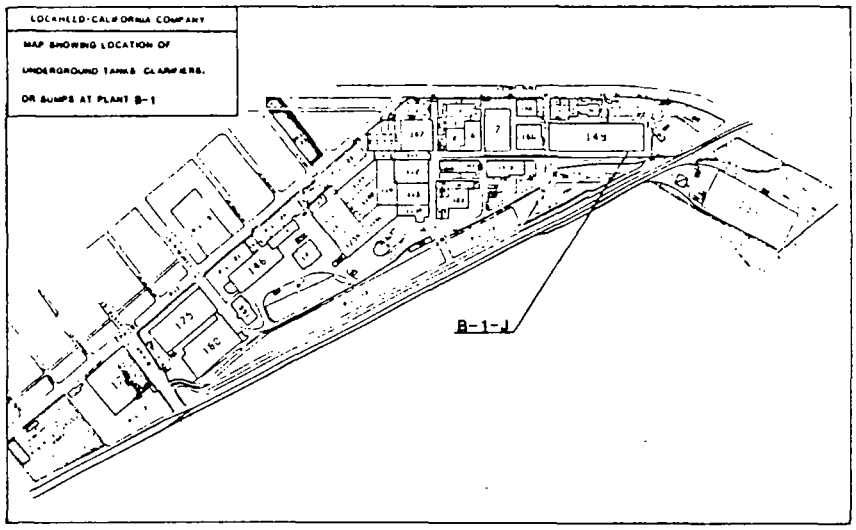
ADDITIONAL INVESTIGATIONS

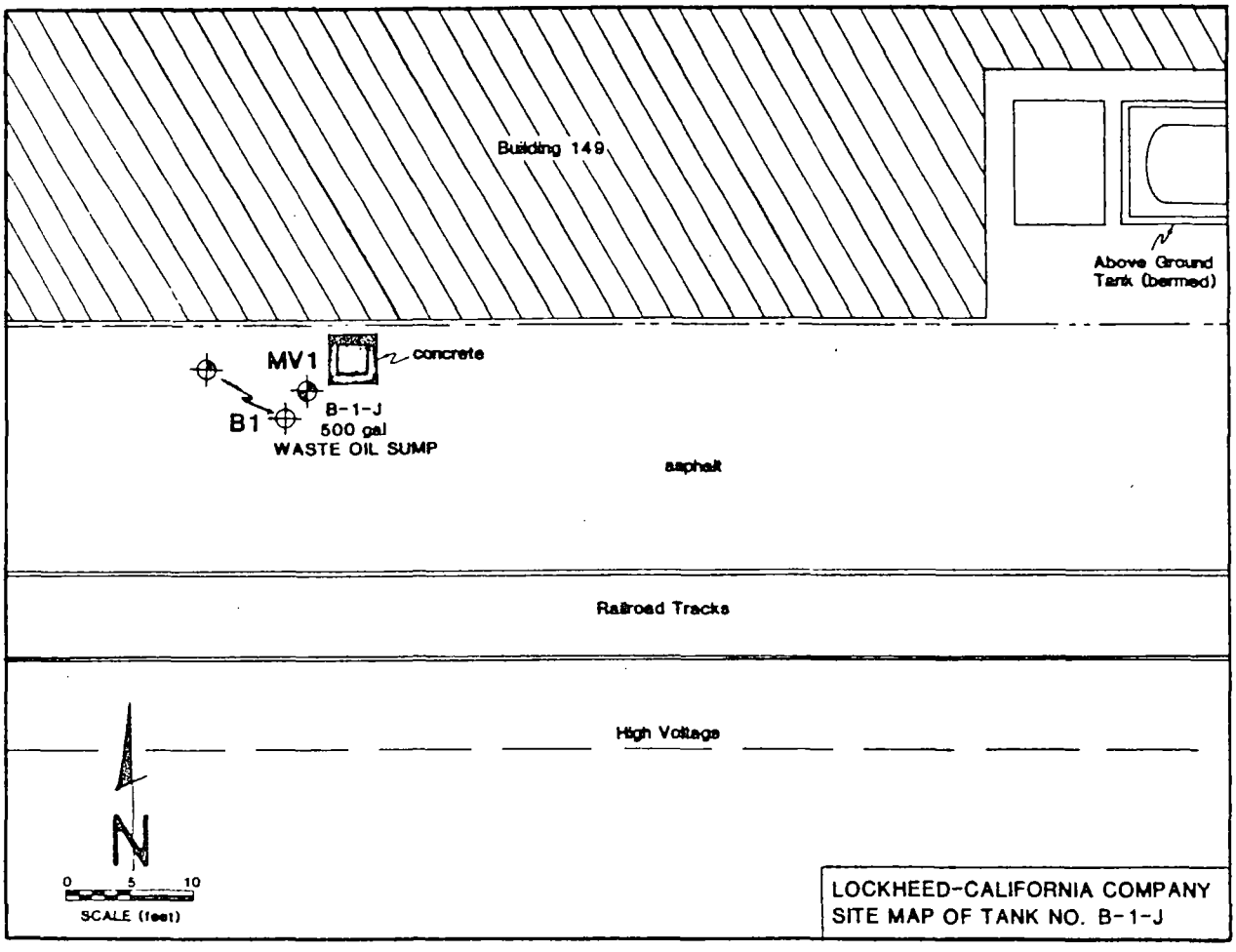
Concrete Sump B-1-J was inspected on May 6, 1985. This sump was constructed monolithically (poured in one piece) and thus has no form joints or seams. The walls have a smooth finish except for the lower corner of the intersection of the west and north wall. This corner is hummocky or "pock marked" which is the result of incomplete vibrocompacting of the concrete as it was poured into the form. The pock marks are strictly surficial, being a maximum of 1/2-inch deep and are an unlikely conduit for leakage. The floor of the sump is a "rough pour" meaning the surface is not smooth. This is because the concrete had to flow into the floor form from the top of the walls making it impossible to vibrocompact or dress the surface of the floor. Again, this is surficial and does not compromise the integrity of the concrete or its ability to seal against leakage.

On the north wall of the sump, directly below the 2-inch inflow pipe, is a small hairline fissure about 3 inches in length. The fissure was probably the result of minute differential settling between the sump and the largely immobile piping system. Although the fissure is slightly stained, it is not possible to score the crack with a pocket knife or fingernail. The crack is not at all disseminated as one would expect a conduit to be if the crack transmitted fluid for any appreciable length of time. In general, Sump B-1-J is apparently structurally sound and not leaking. The contamination in the adjacent soil is most likely attributable to occasional past overfilling of the sump or fugitive surface spillage of other materials.

FURTHER RECOMMENDATIONS

The walls of sump B-1-J are being extended to prevent overflow.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-J

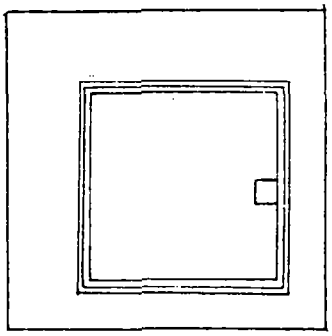

Building 149
Above Ground
Tank (bermed)
MV1
concrete
B1
B-1-J
500 gal
WASTE OIL SUMP
asphalt
Railroad Tracks
High Voltage
N
0
5
10
SCALE (feet)
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-J

PERTINENT CONSTRUCTION AND PROGRAM DATA

0837

Tank No.		B-1-J
Plant No./Nearest Bldg.		B-1/Bldg. 149 (SE Corner)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	500
	Use/Process	Waste Oil Sump
	Contents (past, CMS No., date)	Waste Oil 08334.05
	(present, CMS No.)	Waste Oil 08334.05
	Construction Materials	Concrete
	Geometry	Square
	Depth To Top	UNK
	Depth To Invert	4.7 ft deep
	Diameter	2.2 ft width
	Length (1)	2.2 ft length
	Containment	None
	Corrosive Protection (2)	Int. Coated/Ext. Painted
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	Area covered with oil
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger, Inspection
	Borings (No.)	1
	Sample Depths	B1/5,10,15,20,30,40 ft
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	MW1/5,12 ft
	Completion Interval	MW1/5-12 ft
Laboratory Program (4)		
	No. of Tank Content Samples	1
	Parameters	Hydrocarbons Vol.Org.
	No. of Tank Soil Samples	5
	Parameters	Lead, Hydrocarbons Vol.Org.

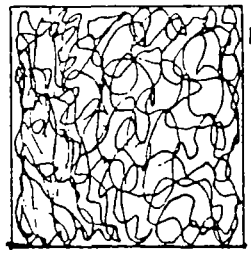
North



Cast Iron Cover

Top

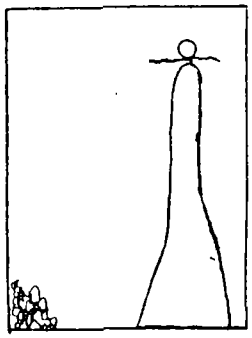
North



Rough Pour, Hummocky Appearance

Appears Structually Sound

Floor



West

East

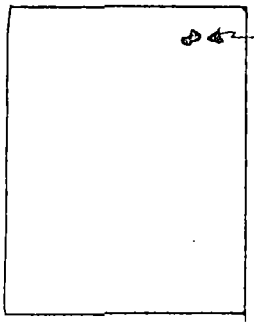
Oil Stain Plume, Strictly Surficial

North Wall

West

East

East Wall



Small 1/2 inch Deep Pockmark, No Conduit

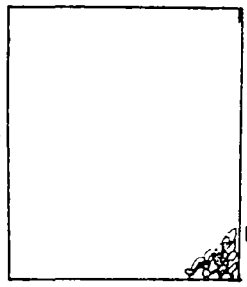
West

East

South Wall

West

East



Incomplete Pour

West Wall

Scale 0 1 5

feet

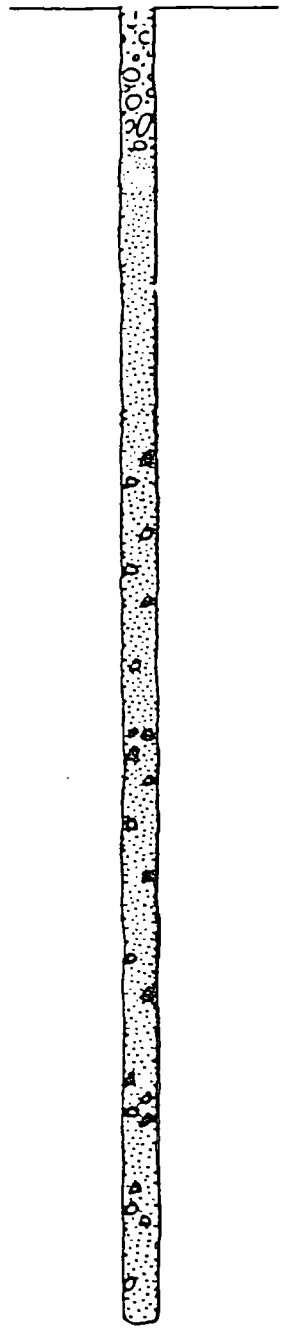
LOCKHEED–CALIFORNIA COMPANY

Sump B-1-J

Figure 2 Inspection Profiles

GENERAL SUMP CONDITION : GOOD

0837

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			-Asphalt
	- 2 -			-Sand,medium grain,dark gray,w/pebbles to cobbles,w/yellow & orange paint fragments,
	- 4 -			
	- 6 -		30	very strong odor, paint fragments are concoidally fractured
	- 8 -			
	- 10 -		20	-Color change,lighter gray,medium to fine grain sand
	- 12 -			
	- 14 -			
	- 16 -		21	-Decreasing odor w/depth -Color change to brown Decreasing cobbles
	- 18 -			
	- 20 -		20	
	- 22 -			
	- 24 -			
	- 26 -			
	- 28 -			
	- 30 -		24	-Grainsize change,Sand, becoming very fine w/ some medium grain & silt particles
	- 32 -			
	- 34 -			
	- 36 -			
	- 38 -			
	- 40 -		50+	-Sand,fine to very fine grain,brown

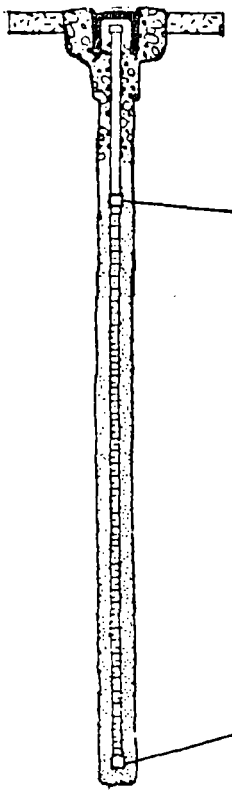
COMPLETION & BACKFILL

-asphalt,0-0.5 ft
-Concrete, 0.5-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-13 ft
-Native material, caved 13-40 ft

TANK NO. B-1-J

BORING NO. B-1-J-B1

GREGG & ASSOCIATES, INC.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		30 18	0837 -Asphalt -Sand,medium to coarse grain,gray,abundant gravel & small cobbles very strong odor debris present,nails, solid steel bars (1-in diameter),paint fragments, etc. pebbles coated w/pink substance, -Large cobble at 5 ft approximately 12-in -Sand,fine grain,gray very strong odor

COMPLETION & BACKFILL

-Blank 2-in I.D. PVC pipe, 0-5 ft
-Screened 2-in I.D. PVC pipe, 5-12 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-13 ft

TANK NO. B-1-J

MONITORING WELL NO. B-1-J-MV1

GREGG & ASSOCIATES, INC.

TABLE B-1-J: RESULTS OF CHEMICAL ANALYSES

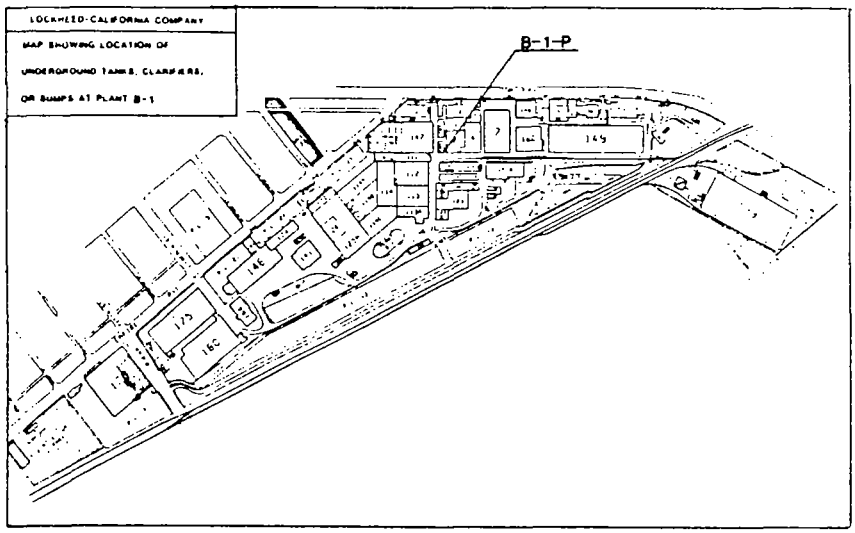
837

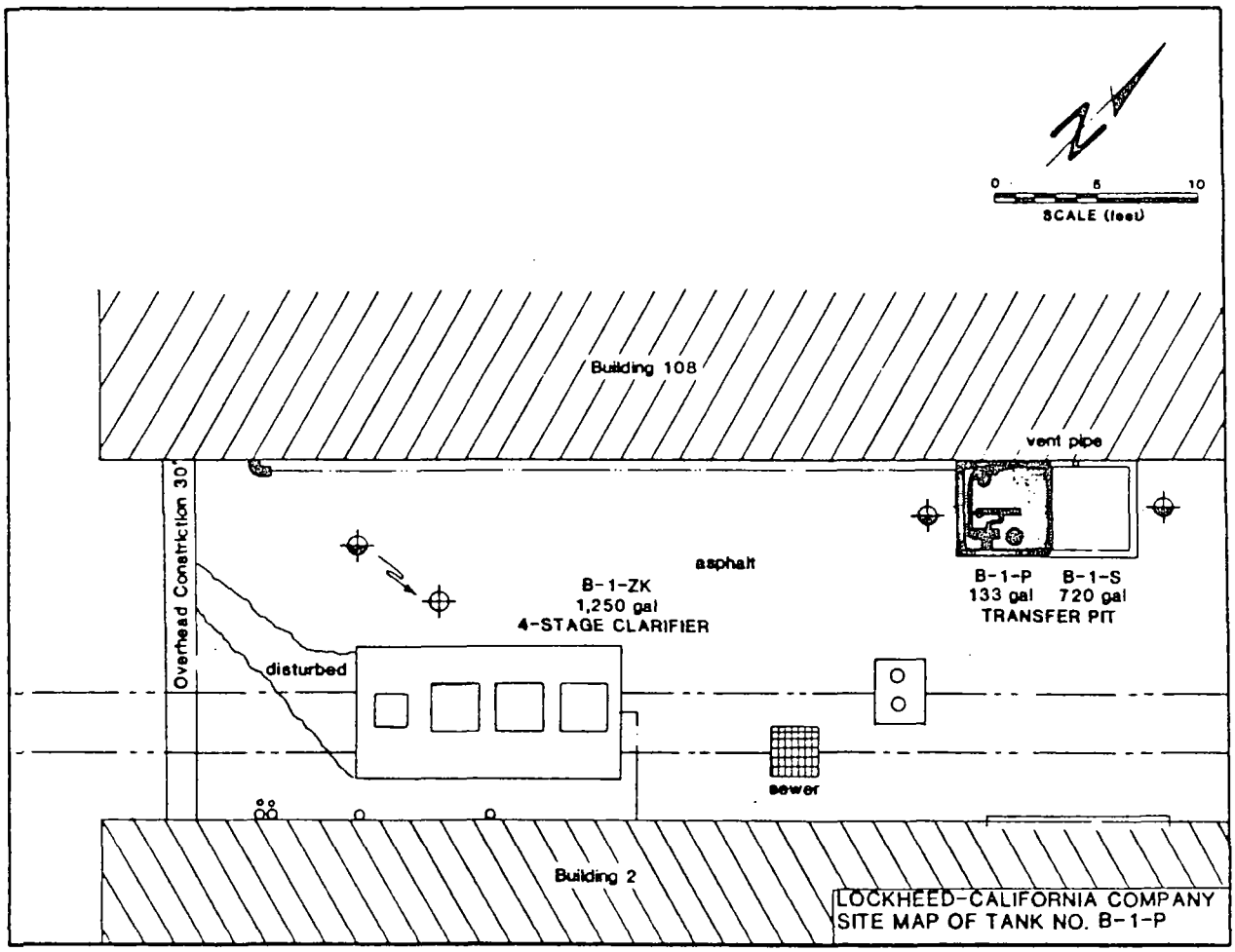
PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-J LIQUID UNTREATED	B-1-J B1 5.5 ft.	B-1-J B1 (Dup.) 5.5 ft.	B-1-J B1 10.5 ft.	B-1-J B1 15.5 ft.	B-1-J B1 20.5 ft.	B-1-J B1 30.5 ft.	B-1-J B1 40.5 ft.
Volatile Organics (ug/kg)		N.A.								
Benzene	<0.2		N.D.	93.3	119	101	84.7	37.3	108	70.3
Ethyl Benzene	<0.1		3630	111	107	67.1	N.D.	27.9	71.5	N.D.
Chloroform	<0.1		N.D.	63.5	46.0	75.2	29.2	36.6	12.0	108
Chloromethane	<0.2		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloroethane	<0.8		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloroethane	<0.1		N.D.	71.8	93.0	80.4	51.8	35.3	111	43.5
1,2-Dichloropropane	<0.1		N.D.	8.1	9.3	7.3	8.2	N.D.	10.4	1.7
1,1,1-Trichlorethane	<0.2		N.D.	955	1110	1310	984	882	1370	1100
1,1,2-Trichloroethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Bromodichloromethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dibromochloromethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethene	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
trans-1,2-Dichloroethene	<0.1		N.D.	5350	5460	4590	1050	N.D.	5810	5.8
Trichloroethene	<0.3	* 2,040	N.D.	777	964	959	647	567	1410	1310
Tetrachloroethene	<0.4		5350	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	<0.4		480	503	549	412	267	42.8	535	430
M-Xylene	N.D.		5890	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
O-P-Xylenes	N.D.		4170	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	21,400	N.T.	6300	22000	5	17700	31100
Oil & Grease (mg/kg)	N.T.	N.A.	>=99% OIL	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
CAM Metals (mg/kg)			N.T.		N.T.					
Antimony	<2.5	500		<2.5		<2.5	<2.5	<2.5	<2.5	<2.5
Arsenic	13.4	500		26.8		25.9	16.4	3.9	27.4	53.2
Barium	91.9	10,000		114		125	86.7	153	91.6	119
Beryllium	<1.0	75		<1.0		1.0	<1.0	<1.0	<1.0	1.5
Cadmium	<2.5	100		<0.5		<0.5	<0.5	<0.5	<0.5	2.3
Chromium (Total)	9.6	2,500		13.8		16.3	11.2	<0.5	12.5	19.4
Cobalt	6.5	8,000		10.3		11.9	8.0	7.4	9.8	12.8
Copper	22.1	250		16.2		18.2	14.4	4.4	20.6	22.7
Lead	<2.5	1,000		<2.5		<2.5	6.5	<2.5	<2.5	3.4
Mercury	<0.1	20		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	6.3	3,500		<1.0		<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	8.4	2,000		11.3		13.5	7.7	9.8	10.2	16.0
Selenium	<2.5	100		<2.5		<2.5	<2.5	<2.5	<2.5	<2.5
Silver	<2.5	500		<2.5		<2.5	<2.5	<2.5	<2.5	<2.5
Thallium	<2.5	700		<2.5		<2.5	<2.5	<2.5	<2.5	<2.5
Vanadium	22.0	2,400		36		38.8	28.4	0.9	31.8	46.3
Zinc	38.7	2,500		76.6		55.6	35.6	48.7	39.6	49.7
Others			N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
pH (standard units)	8.24	N.A.								
Cyanide (mg/kg)	<0.2	N.A.								
Sulfate (mg/kg)	N.T.	N.A.								

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION
* mg/kg

TANK B-1-P

The integrity of Tank B-1-P will be determined by visual inspection, as approved by Mr. Al Novak, RWQCB, In the field. The facility consists of a two-stage transfer pit for softener brine from a boiler room. Tank B-1-P is the first stage of this system and has a 133-gallon capacity. The second stage is labeled Tank B-1-S and is discussed separately (see Tank B-1-S). The transfer pit is placed in concrete reportedly 3 to 5 feet thick. This thickness of concrete in an area congested with underground pipes precludes use of safe and practical drilling methods. However, while this thickness of concrete prevents drilling, it also serves as a barrier against surficial leaks. The only avenue for leakage would be a crack extending the depth of the concrete. Such a crack would have some surface expression and would, therefore, de detected in a visual inspection. The results of this inspection will be added to this report upon completion.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-P

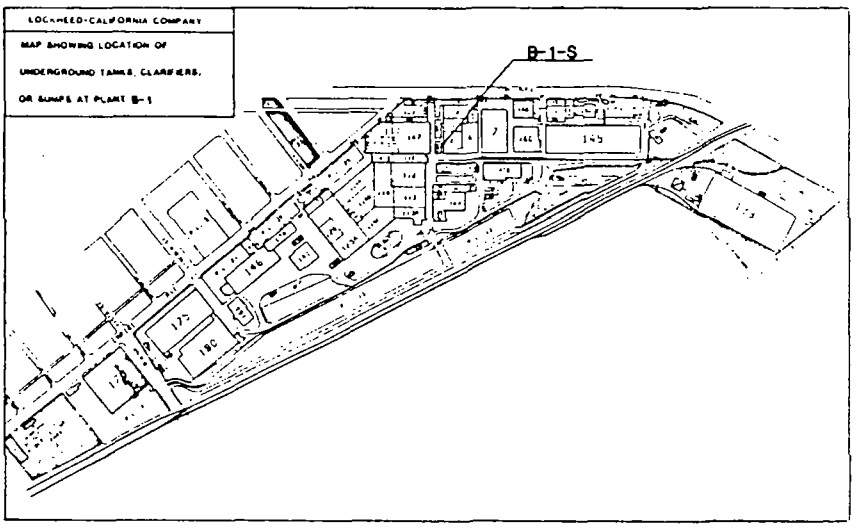

0 5 10
SCALE (feet)
Building 108
vent pipe
Overhead Constriction 30
asphalt
B-1-ZK
1,250 gal
4-STAGE CLARIFIER
B-1-P
133 gal
B-1-S
720 gal
TRANSFER PIT
disturbed
sewer
Building 2
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-P

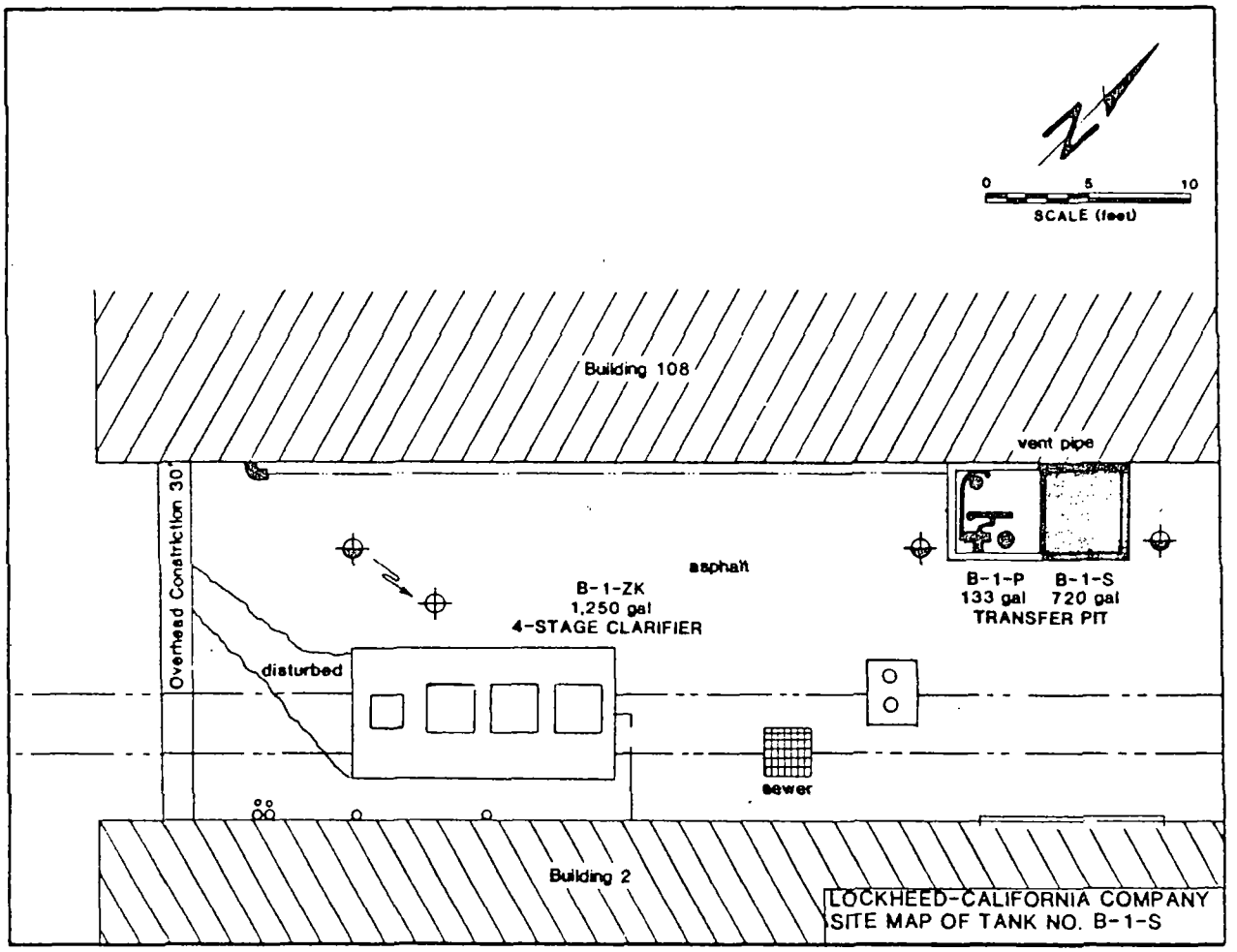
PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-P
Plant No./Nearest Bldg.		B1/Bldg. 108 (E Side)
Tank:	Location	1705 Victory Place
	Installation Date	1979
	Capacity, gal.	133
	Use/Process	To be water softener transfer pit
	Contents (past,CAS No.,date)	Sodium chloride 7647145
	(present,CAS No.)	Sodium chloride 7647145
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Int. coated
	Status	Not yet in service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Inspection
	Borings (No.)	0 (just in service)
	Sample Depths	0
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

TANK B-1-S

The integrity of Tank B-1-S will be determined by visual inspection, as approved by Mr. Al Novak, RWQCB, In the field. The facility consists of a two-stage transfer pit for softener brine from a boiler room. Tank B-1-S is the second stage of this system and has a 720-gallon capacity. The first stage is labeled Tank B-1-P and is discussed separately (see Tank B-1-P). The transfer pit is placed in concrete reportedly 3 to 5 feet thick. This thickness of concrete in an area congested with underground pipes precludes use of safe and practical drilling methods. However, while this thickness of concrete prevents drilling, it also serves as a barrier against surficial leaks. The only avenue for leakage would be a crack extending the depth of the concrete. Such a crack would have some surface expression and would, therefore, de detected in a visual inspection. The results of this inspection will be added to this report upon completion.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-S


N
0
5
10
SCALE (feet)
Building 108
vent pipe
Overhead Constriction 30
asphalt
B-1-ZK
1,250 gal
4-STAGE CLARIFIER
B-1-P
133 gal
B-1-S
720 gal
TRANSFER PIT
disturbed
sewer
Building 2
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-S

PERTINENT CONSTRUCTION AND PROGRAM DATA

0837

Tank No.		B-1-S
Plant No./Nearest Bldg.		B-1/Bldg. 108 (E Side)
Tank:	Location	1705 Victory Place
	Installation Date	1979
	Capacity, gal.	720
	Use/Process	To be boiler blowdown transfer pit
	Contents (past,CAS No.,date)	None
	(present,CAS No.)	Boiler blowdown
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Int. coated/ Ext. painted
	Status	Not yet in service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Inspection
	Borings (No.)	0 (just in service)
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

FIELD PROGRAM

Two borings, which were converted to suction lysimeters, and one exclusive suction lysimeter were drilled/installed to assess conditions surrounding Clarifier B-1-U. There were only two lysimeters originally scheduled to be installed. However, discussion with Mr. Al Novak (RWQCB) indicated that a third lysimeter should be added because of the distances between monitoring installations.

BORING/SUCTION LYSIMETER B-1-U-B1/B-1-U-SL2

Monitoring Installations - Boring/Suction Lysimeter B-1-U-B1/SL2 was drilled/installed north of the approved location because it was possible to drill closer to the clarifier than was originally anticipated. Both the actual and approved locations of the boring/suction lysimeter are indicated on the site map.

Sampling Intervals - Soil samples from the boring/suction lysimeter were to have been collected at depths of 8, 13, 18, 25 and 40 feet according to the work plan. However, the sample intervals were shifted to 5, 13, 20, 30 and 40 feet. The intervals that were sampled reflect a more uniform spacing than the original intervals.

Field Observations - The red color and the medium to coarse grain size of the sand remained consistent throughout the first 13 feet of the boring/suction lysimeter. The soil contained many small cobbles. At 13 feet, the sand became a grey-brown, medium to coarse sand and the gravel and cobble fraction decreased. The soil became progressively more brown and finer grained with depth.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. The red color and the high moisture content of the sand may be indicative of chromic acid contamination.

BORING/SUCTION LYSIMETER B-1-U-B2/B-1-U-SL3

Monitoring Installations - Boring/Suction Lysimeter B-1-U-B2/SL3 was drilled/installed to monitor the west end of the clarified as was instructed by Al Novak (RWQCB). The location of the boring/suction lysimeter is indicated on the site map.

Sampling Intervals - Soil samples were taken from the boring/suction lysimeter at depths of 5, 13, 20, 30 and 40 feet.

Field Observations - The upper 5 feet of the boring was predominantly pea-size gravel which was apparently placed there as fill. The gravel diminished at 5 feet and red medium to coarse sand continued to 12 feet. At 12 feet the sand turned to a brown color and continued to 30 feet. At 30 feet the sand became slightly finer and grey in color. The occurrence of cobbles between 5 and 40 feet remained sporadic.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination other than the discoloration of the sand between 5 and 12 feet.

SUCTION LYSIMETER B-1-U-SL1

Monitoring Installations - Suction Lysimeter B-1-U-SL1 was installed to monitor the clarifier south of the approved location due to rig access problems. both the actual and approved location of the suction lysimeter are indicated on the site map.

Sampling Intervals - Soil samples were taken from the suction lysimeter at a depth of 12 feet, as approved in the Work Plan.

Field Observations - The brown color and medium to coarse grain size of the sand remained consistent throughout the borehole.

There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

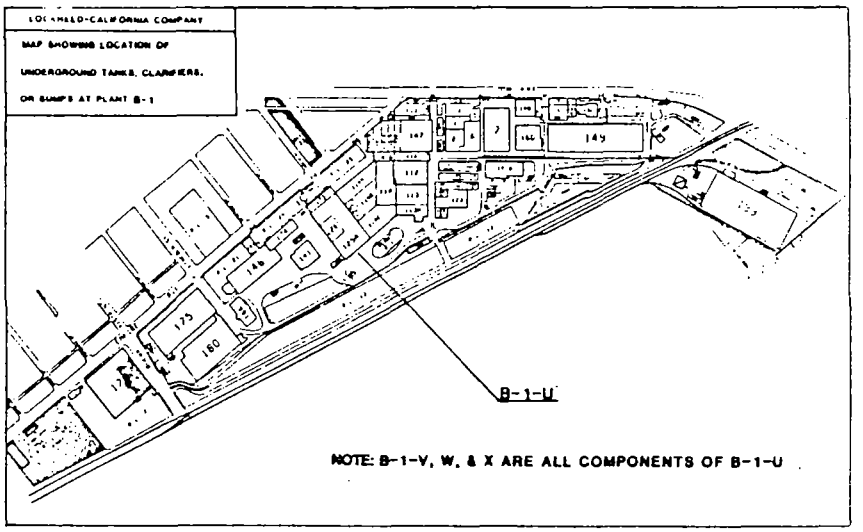
Laboratory Program - Soil samples were collected from Borings B-1-U-B1 and B-1-U-B2, and Lysimeter B-1-U-SL1. A composite of the Boring B-1-U-B1 samples and a composite of the Boring B-1-U-B2 samples were each analyzed for total chromium, sulfate, and pH. The individual depth samples from Boring B-1-U-B2 were analyzed for sulfate. A depth-specific sample from Suction Lysimeter B-1-U-SL1 was also analyzed for total chromium, sulfate, and pH. These analyses have been approved in the Work Plan.

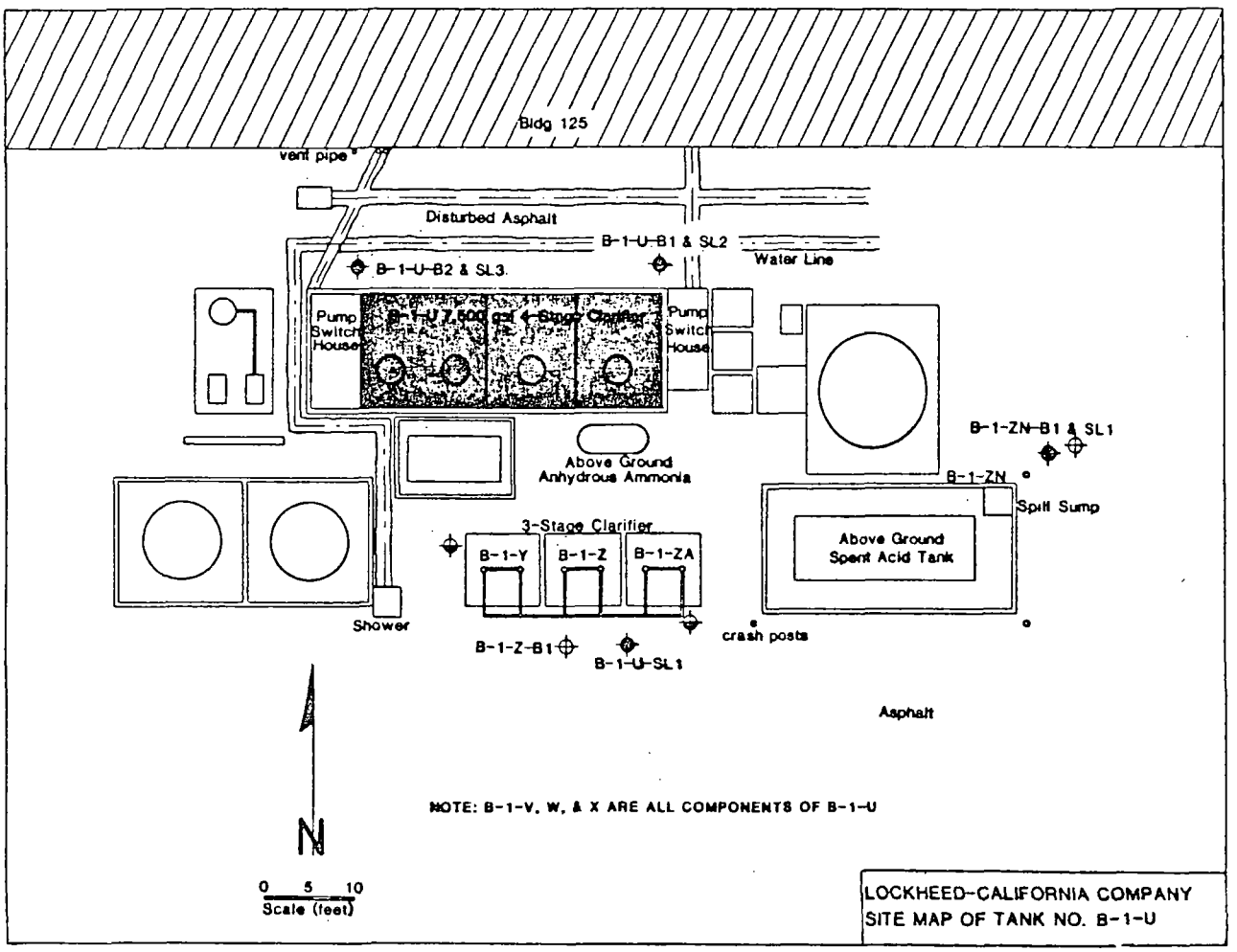
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-U. Chromium and pH levels were found to be near the levels reported for the B-1 background samples. The concentrations of sulfate in the Boring B-1-U-B1 composite and the Lysimeter B-1-U-SL1 samples were below the level of detection. A sulfate concentration of 47.2 mg/kg was reported for the Boring B-1-U-B2 composite sample. Individual depth samples were analyzed for sulfate, and concentrations ranged from <6 to 29.8 mg/kg. Data for the individual depth samples are presented in Appendix A.

TANK B-1-U (continued)

Conclusions - Based on field observations and laboratory results, it is concluded that Clarifier B-1-U is not leaking. Laboratory results indicate that the levels of chromium, sulfate, and pH reported for B-1-U-B1 and B-1-U-SL1 are below the limits of detection or near the levels observed in the background samples. The soil samples from Boring B-1-U-B2 were found to contain moderate levels of sulfate. However, sulfate is a naturally occurring compound in soil systems and the presence of this compound at a moderate level does not suggest contamination. Since the clarifier contains (and has contained in the past) sodium dichromate, the absence of chromium contamination supports the conclusion that Clarifier B-1-U is not leaking.

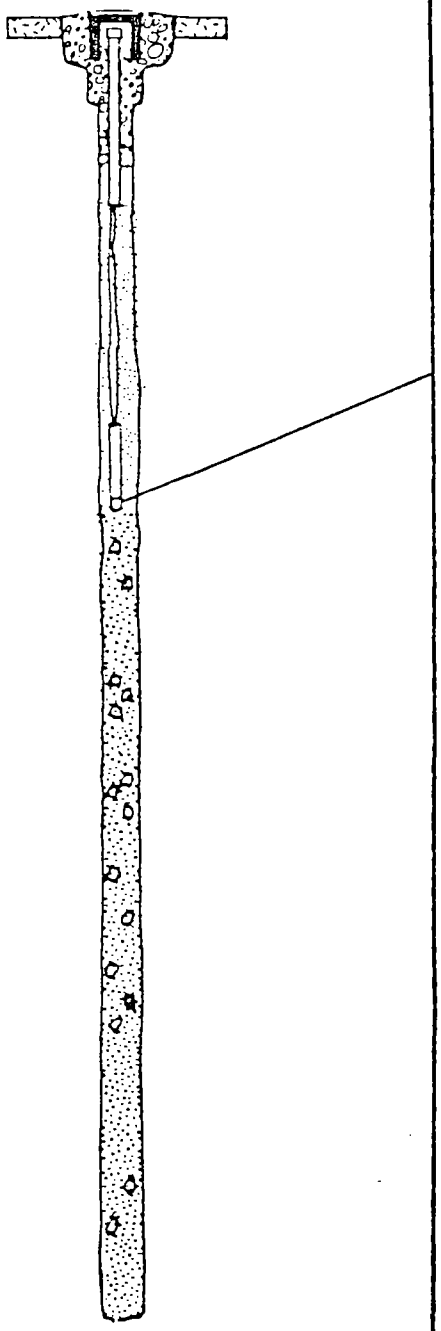
Recommendation - Proceed with quarterly monitoring of the suction lysimeter.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-U
NOTE: B-1-V, W, & X ARE ALL COMPONENTS OF B-1-U


Bldg 125
vent pipe
Disturbed Asphalt
B-1-U-B1 & SL2
Water Line
B-1-U-B2 & SL3
Pump Switch House
B-1-U 7,500 gal 4-Stage Clarifier
Pump Switch House
B-1-ZN-B1 & SL1
B-1-ZN
Spill Sump
Above Ground Anhydrous Ammonia
3-Stage Clarifier
B-1-Y
B-1-Z
B-1-ZA
Above Ground Spent Acid Tank
Shower
crash posts
B-1-Z-B1
B-1-U-SL1
Asphalt
NOTE: B-1-V, W, & X ARE ALL COMPONENTS OF B-1-U
N
0 5 10
Scale (feet)
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-U

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-U
Plant No./Nearest Bldg.		B-1/Bldg. 125A (S Side)
Tank:	Location	1705 Victory Place
	Installation Date	1969
	Capacity, gal.	2,500
	Use/Process	Metal cleaning treatment clarifier (4-stage)
	Contents (past,CAS No.,date)	Dilute sulfuric acid 7664939 Sodium dichromate 7789120
	(present,CAS No.)	Dilute sulfuric acid 7664939 Sodium dichromate 7789120
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (')	UNK
	Containment	None
	Corrosive Protection (2)	Int. Coated
	Status	In Service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Aspnalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger
	Borings (No.)	2
	Sample Depths	B1/5,13,20,30,40 ft B2/5,13,20,30,40 ft
	Vapor Wells/Lysimeter (No.)	3
	Sample Depths	SL1/REF. TO B1 SL2/REF. TO B2 SL3/12 ft
	Completion Interval	SL1 & SL2/11 ft SL3/12 ft
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	1 & 2(comp.)
	Parameters	Cr,pH,SO4

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		15 20 15 30 50+	-Asphalt -Sand,medium to coarse grain,red,abundant gravel to small cobbles red color appears to be a stain,sand grains are in clusters of 6 to 10 grains giving the appearance of peagravel -Color change Sand,medium to coarse w/ some fine grain,gray, occasional cobbles, variegated gray & brown -Sand, finder grain with depth,color change,brown with depth

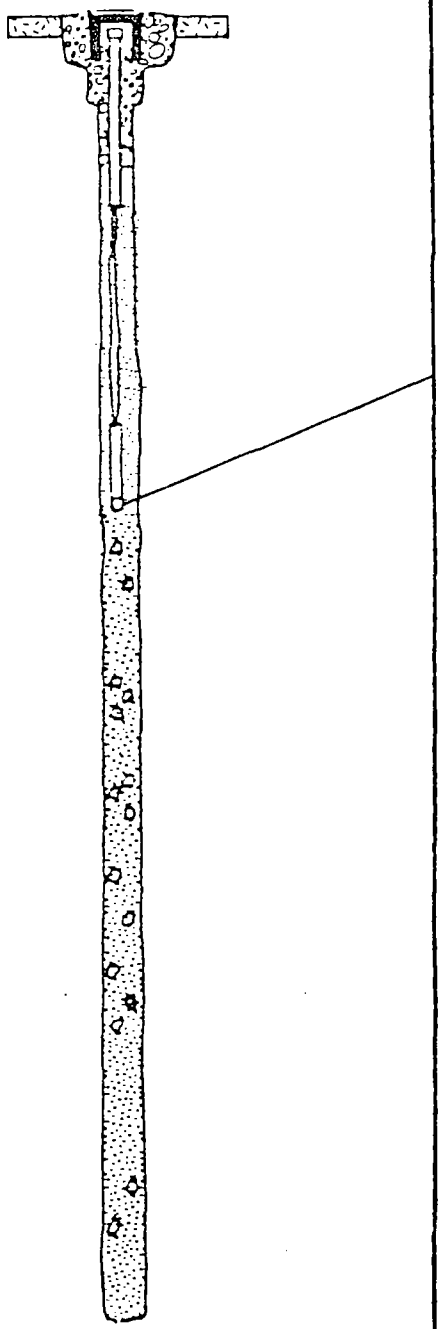
COMPLETION & BACKFILL

-Suction Lysimeter at 11 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean silica sand, 5-11 ft
-Native material, backfill 11-40 ft

TANK NO. B-1-U

BORING NO. B-1-U-B1

GREGG & ASSOCIATES, INC.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		8 40 45 50+ 50+	-Asphalt -Artificial fill: Gravel w/some sand,gray -Sand,coarse grain,red-brown,w/up to 1-in gravel -Sand,medium to coarse grain,brown,w/small cobbles & gravel -Sand,fine to medium grain,gray-brown, occasional cobbles & gravel

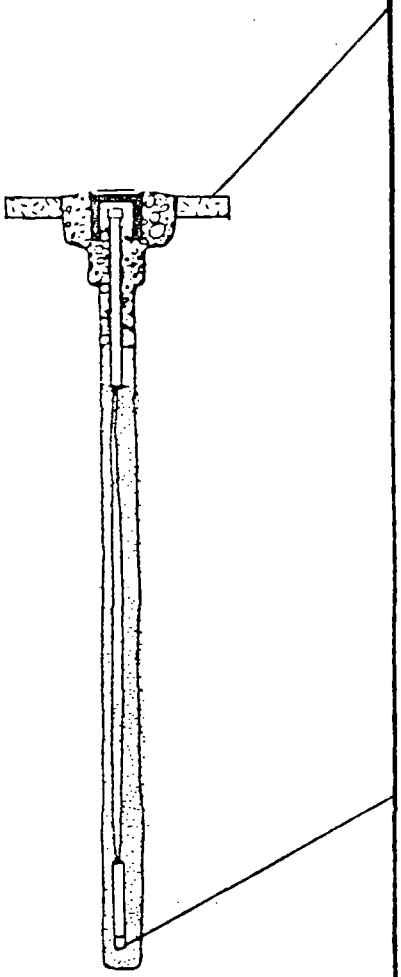
COMPLETION & BACKFILL

-Suction Lysimeter at 11 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-7 ft
-Clean sand & silica sand mix, 7-11 ft
-Native material, backfill 11-40 ft

TANK NO. B-1-U

BORING NO. B-1-U-B2

GREGG & ASSOCIATES, INC.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - 12 - - 13 - - 14 - - 15 - - 16 - - 17 - - 18 - - 19 - - 20 -		30	-Asphalt -Sand,medium to coarse grain,brown,w/some gravel (to 2-in)

COMPLETION & BACKFILL

-Suction Lysimeter at 12 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-8 ft
-Clean sand & native mix 8-12 ft

TANK NO. B-1-U

SUCTION LYSIMETER NO. B-1-U-SL1

GREGG & ASSOCIATES, INC.

TABLE B-1-U: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-U B1 COMPOSITE	B-1-U B2 13 ft.	B-1-U B2 20 ft.	B-1-U B2 30 ft.	B-1-U B2 40 ft.	B-1-U B2 COMPOSITE	B-1-U SL1 12.5 ft.
Volatile Organics (ug/kg)		N.A.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
Benzene	<0.2								
Ethyl Benzene	<0.1								
Chloroform	<0.1								
Chloromethane	<0.2								
Chloroethane	<0.8								
1,1-Dichloroethane	<0.1								
1,2-Dichloroethane	<0.1								
1,2-Dichloropropane	<0.1								
1,1,1-Trichlorethane	<0.2								
1,1,2-Trichloroethane	<0.1								
Bromodichloromethane	<0.1								
Dibromochloromethane	<0.1								
1,1-Dichloroethene	<0.1								
trans-1,2-Dichloroethene	<0.1								
Trichloroethene	<0.3	* 2,040							
Tetrachloroethene	<0.4								
Toluene	<0.4								
Methyl Ethyl Ketone	<0.5								
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.	NT..	N.T.	N.T.	N.T.	N.T.
CAM Metals (mg/kg)				N.T.	N.T.	N.T.	N.T.		
Antimony	<2.5	500	N.T.					N.T.	N.T.
Arsenic	13.4	500	N.T.					N.T.	N.T.
Barium	91.9	10,000	N.T.					N.T.	N.T.
Beryllium	<1.0	75	N.T.					N.T.	N.T.
Cadmium	<2.5	100	N.T.					N.T.	N.T.
Chromium (Total)	9.6	2,500	6.8					10.4	6.0
Cobalt	6.5	8,000	N.T.					N.T.	N.T.
Copper	22.1	250	N.T.					N.T.	N.T.
Lead	<2.5	1,000	N.T.					N.T.	N.T.
Mercury	<0.1	20	N.T.					N.T.	N.T.
Molybdenum	6.3	3,500	N.T.					N.T.	N.T.
Nickel	8.4	2,000	N.T.					N.T.	N.T.
Selenium	<2.5	100	N.T.					N.T.	N.T.
Silver	<2.5	500	N.T.					N.T.	N.T.
Thallium	<2.5	700	N.T.					N.T.	N.T.
Vanadium	22.0	2,400	N.T.					N.T.	N.T.
Zinc	38.7	2,500	N.T.					N.T.	N.T.
Others									
pH (standard units)	8.24	N.A.	8.10	N.T.	N.T.	N.T.	N.T.	8.07	8.19
Sodium (mg/kg)	403	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
Cyanide (mg/kg)	<0.2	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
Sulfate (mg/kg)	<6	N.A.	<7.5	11.1	26.1	29.8	<6	47.2	<5.0

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION
* mg/kg

TANK B-1-V

Tank B-1-V was found to be a component of Clarifier B-1-U. See discussion for Tank B-1-U.

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-V
Plant No./Nearest Bldg.		B-1/Bldg. 125 (S Side)
Tank:	Location	1705 Victory Place
	Installation Date	1969
	Capacity, gal.	2,500
	Use/Process	UNK
	Contents (past,CAS No.,date)	Dilute sulfuric acid 7664939 Sodium dichromate 7789120
	(present,CAS No.)	Dilute sulfuric acid 7664939 Sodium dichromate 7789120
	Construction Materials	Concrete
	Geometry	UNK
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	UNK
	Corrosive Protection (2)	Int. Coated
	Status	UNK
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	UNK
Site:	Paving Material/Thickness	UNK
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	REF. TO B-1-U
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

TANK B-1-W

Tank B-1-W was found to be a component of Clarifier B-1-U. See discussion for Tank B-1-U.

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-W
Plant No./Nearest Bldg.		81-/Bldg. 125
Tank:	Location	1705 Victory Place
	Installation Date	1969
	Capacity, gal.	2,500
	Use/Process	UNK
	Contents (past,CAS No.,date)	Dilute Sulfuric acid 7664939 Dilute Sodium dichromate 7789120
	(present,CAS No.)	Dilute Sulfuric acid 7664939 Dilute Sodium dichromate 7789120
	Construction Materials	Concrete
	Geometry	UNK
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	UNK
	Corrosive Protection (2)	Int. Coated
	Status	UNK
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	UNK
Site:	Paving Material/Thickness	UNK
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	REF. TO B-1-U
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

TANK B-1-X

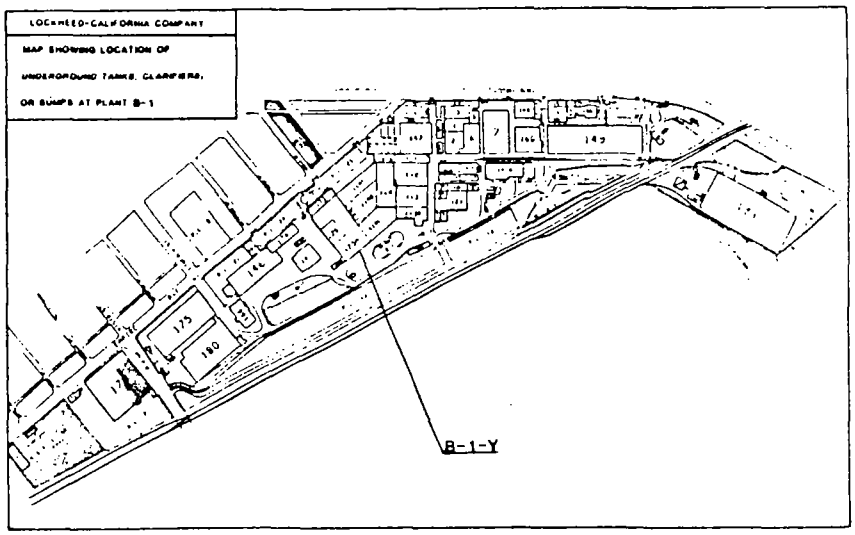
Tank B-1-X was found to be a component of Clarifier B-1-U. See discussion for Tank B-1-U.

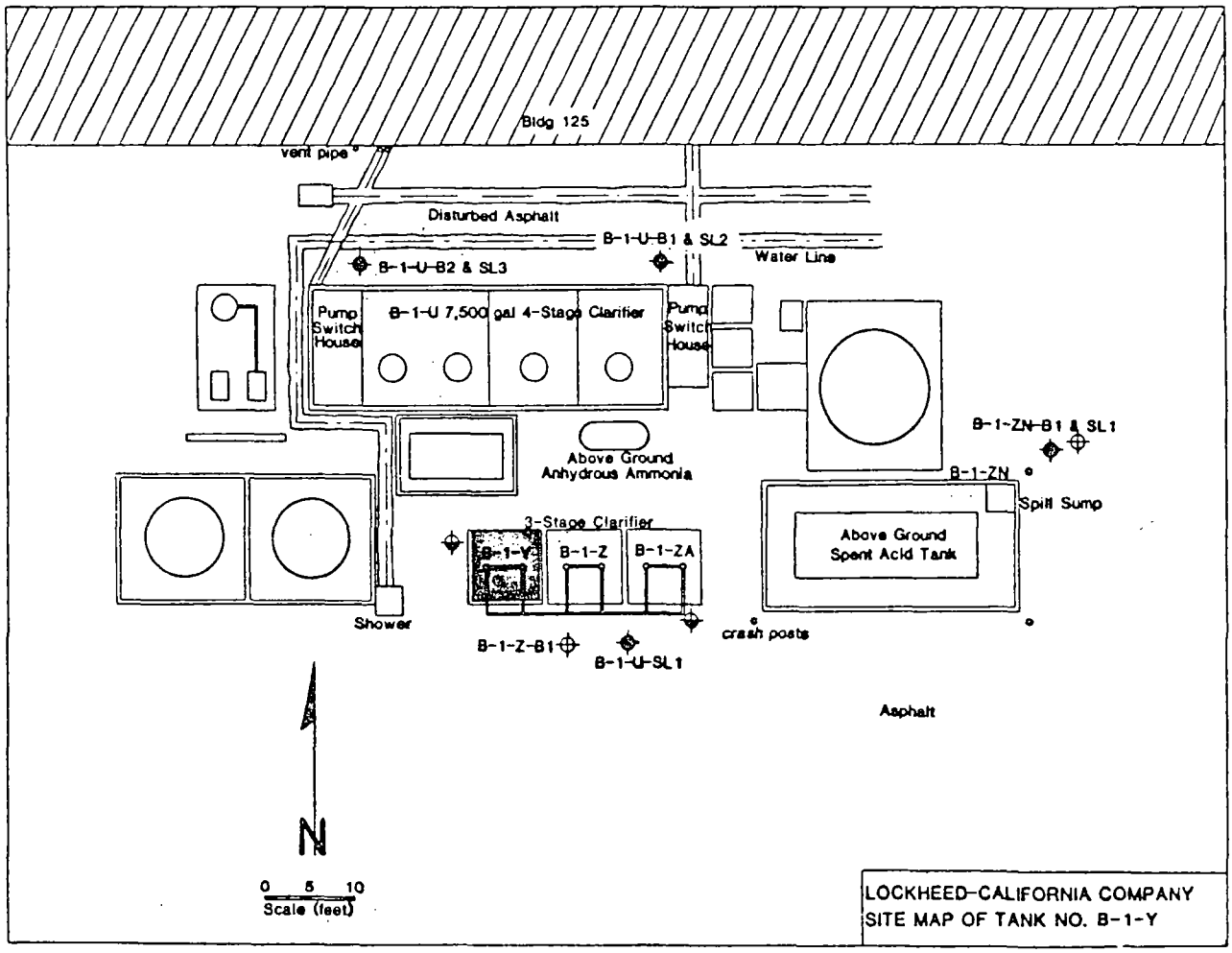
PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-I
Plant No./Nearest Bldg.		B1/Bldg.125
Tank:	Location	1705 Victory Place
	Installation Date	1969
	Capacity, gal.	1,000
	Use/Process	UNK
	Contents (past,CAS No.,date)	UNK
	(present,CAS No.)	Chromic hydroxide 82704221
	Construction Materials	Concrete
	Geometry	UNK
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	UNK
	Corrosive Protection (2)	Int. Coated
	Status	UNK
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	UNK
Site:	Paving Material/Thickness	UNK
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	REF. TO B-1-U
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

TANK B-1-Y

Tank B-1-Y is the first stage of a three-stage clarifier. This clarifier is discussed under Tank B-1-Z, the center stage of the clarifier. The third stage, Tank B-1-ZA, is also discussed under Tank B-1-Z.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-Y


Bldg 125
vent pipe
Disturbed Asphalt
B-1-U-B1 & SL2
Water Line
B-1-U-B2 & SL3
Pump Switch House
B-1-U 7,500 gal 4-Stage Clarifier
Pump Switch House
B-1-ZN-B1 & SL1
Above Ground Anhydrous Ammonia
B-1-ZN
Spill Sump
3-Stage Clarifier
B-1-Y
B-1-Z
B-1-ZA
Above Ground Spent Acid Tank
Shower
crash posts
B-1-Z-B1
B-1-U-SL1
Asphalt
N
0 5 10
Scale (feet)
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-Y

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-Y
Plant No./Nearest Bldg.		B-1/Bldg. 125A (S Side)
Tank:	Location	1705 Victory Place
	Installation Date	1980
	Capacity, gal.	4,400
	Use/Process	Transfer clarifier containing process rinses
	Contents (past,CAS No.,date)	None
	(present,CAS No.)	Chromic acid 82704221 Sulfuric acid 7664939 Hydrofluoric acid
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Int. lined
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Inspection
	Borings (No.)	0 (just in service)
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

TANK NUMBER B-1-Z

FIELD PROGRAM

One boring and one suction lysimeter were drilled/installed to assess conditions surrounding clarifier B-1-Z, B-1-Y and B-1-ZA which are components of the same system.

Monitoring Installations - The Boring B-1-Z-B1 was drilled to establish background soil conditions prior to commencement of operations at B-1-Z, B-1-Y and B-1-ZA. The location of the boring is indicated on the site map.

Sampling Intervals - Soil samples were taken from the boring at depths of 10, 20, 30 and 40 feet. These intervals are thought to accurately characterize the soil's chemical composition.

Field Observations - The medium to coarse grain size of the sand remained consistent throughtout the first 16 feet of the boring. At 16 feet, the sand became finer and the gravel and cobble fraction increased.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

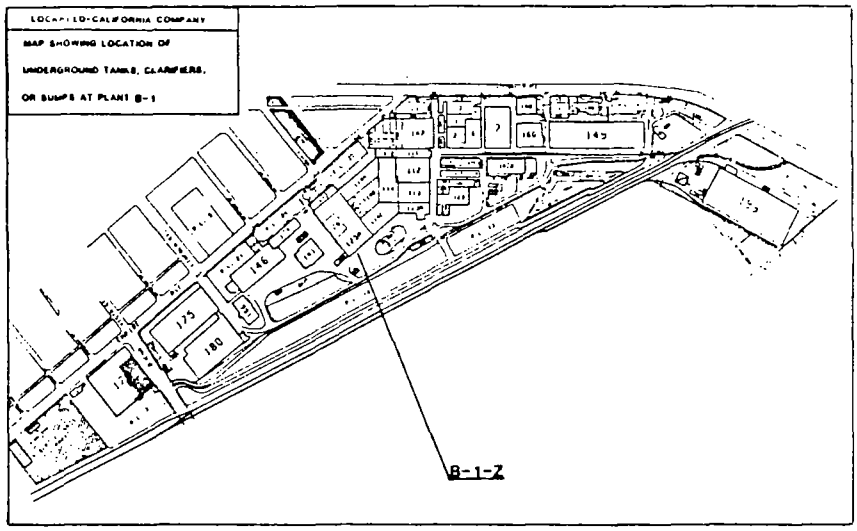
Laboratory Program - Soil samples were collected from Boring B-1-Z-B1 at depths of 10, 20, 30, and 40 feet. The samples collected from the two shallower depths and a composite of the 30 and 40 foot samples were analyzed for volatile organics, petroleum hydrocarbons, CAM metals, cyanide, and pH.

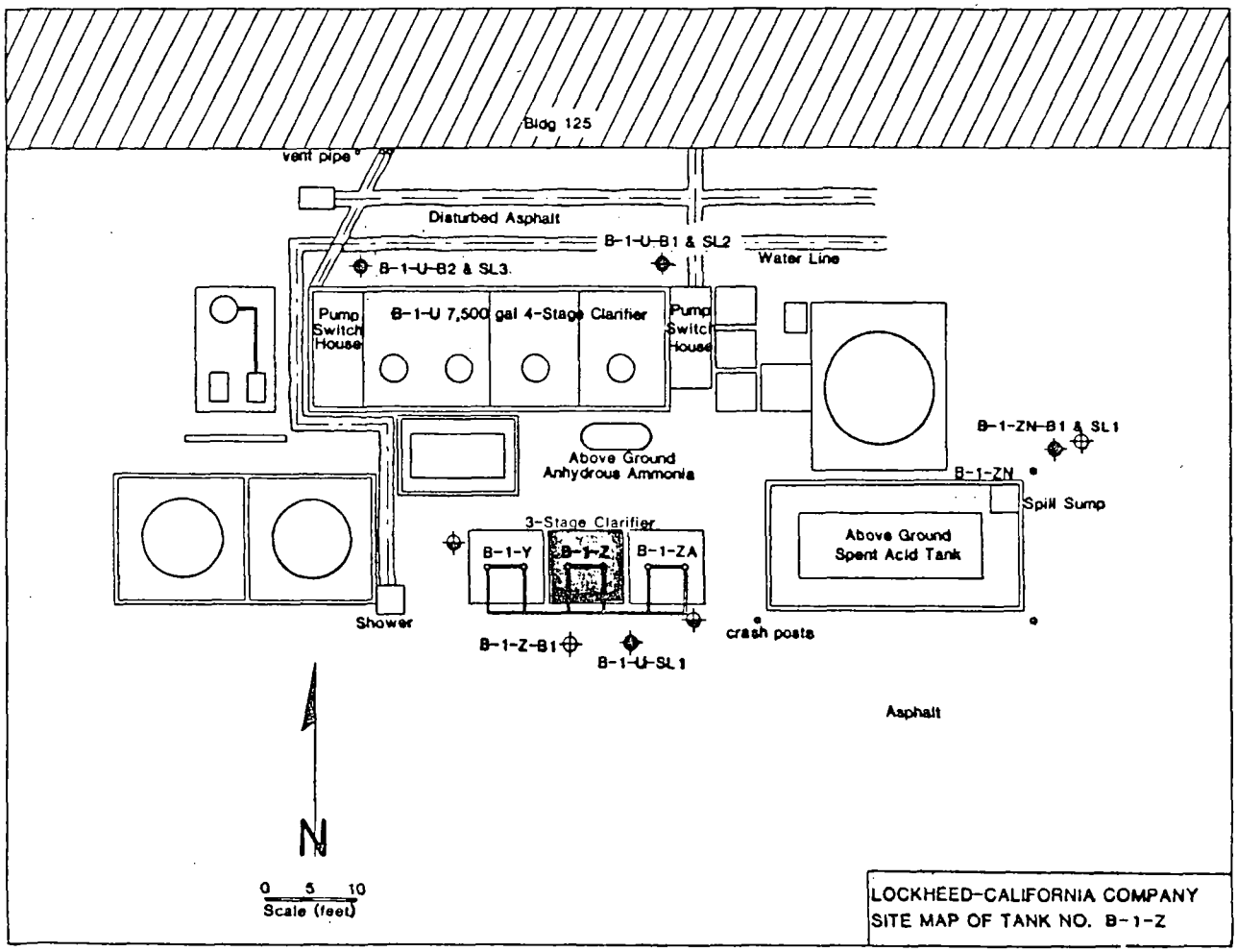
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-Z. Low levels of methyl ethyl ketones were detected in the 10 and 20 foot samples (6.8 and 8.1 ug/kg, respectively). The concentrations of CAM metals in the samples were comparable to the levels observed in the background sample. The concentrations of volatile organic compounds (other than methyl ethyl ketone), cyanide, and pH in the sample were found to be below the limits of detection or near the levels reported for the background samples.

Conclusions - Laboratory results indicate that a low to moderate level of methyl ethyl ketone was found in the depth-specific samples. Volatile organic compounds (other than methyl ethyl ketone), cyanide, and pH were below the limits of detection or near the background levels in the depth-specific, and composite

samples. It is concluded that the low to moderate levels of methyl ethyl ketone found in the soil samples are likely the result of surface spills or to clarifier overflow and that it is unlikely that Clarifier B-1-Z is leaking.

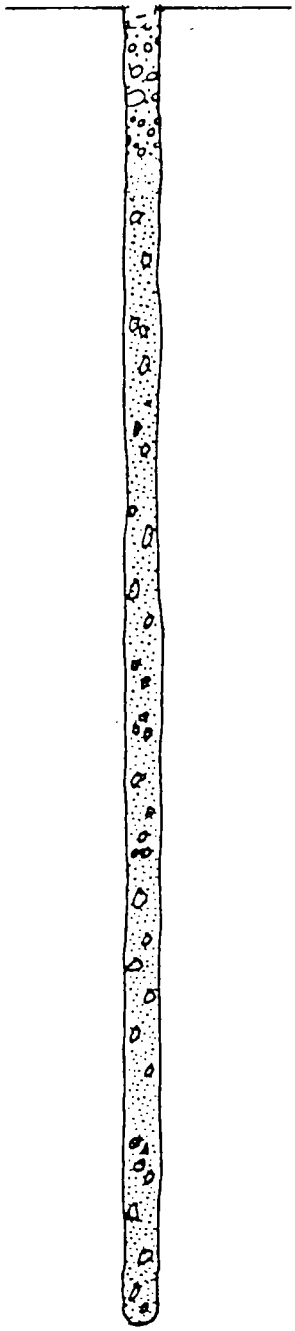
Recommendations - Proceed with quarterly monitoring of the bore hole.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-Z


Bldg 125
vent pipe
Disturbed Asphalt
B-1-U-B1 & SL2
Water Line
B-1-U-B2 & SL3
Pump Switch House
B-1-U 7,500 gal 4-Stage Clarifier
Pump Switch House
B-1-ZN-B1 & SL1
Above Ground Anhydrous Ammonia
B-1-ZN
Spill Sump
3-Stage Clarifier
B-1-Y
B-1-Z
B-1-ZA
Above Ground Spent Acid Tank
Shower
crash posts
B-1-Z-B1
B-1-U-SL1
Asphalt
N
0 5 10
Scale (feet)
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-Z

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-2
Plant No./Nearest Bldg.		B-1/Bldg. 125A (S Side)
Tank:	Location	1705 Victory Place
	Installation Date	1980
	Capacity, gal.	4,400
	Use/Process	To be transfer clarifier distillation blowdown
	Contents (past, CAS No., gate)	None
	(present, CAS No.)	Sulfuric acid 7664939 Sodium hydroxide 1310732
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Int. lined
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S. Auger
	Borings (No.)	1
	Sample Depths	81/10,20,30,40 ft
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	2 & 1(Comp.)
	Parameters	CAM, Cn, pH, Vol. Org. Hydrocarbons

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		16 50+ 26 50+	-Asphalt -Sand,medium to coarse grain,brown,w/gravel -Sand,fine to medium grain,brown,moist, w/gravel -Sand,medium to coarse grain,tan,w/gravel

COMPLETION & BACKFILL

-Asphalt, 0-0.5 ft
-Concrete, 0.5-4 ft
-Bentonite, 4-5 ft
-Native material, backfill 5-40 ft

TANK NO. B-1-Z

BORING NO. B-1-Z-B1

GREGG & ASSOCIATES, INC.

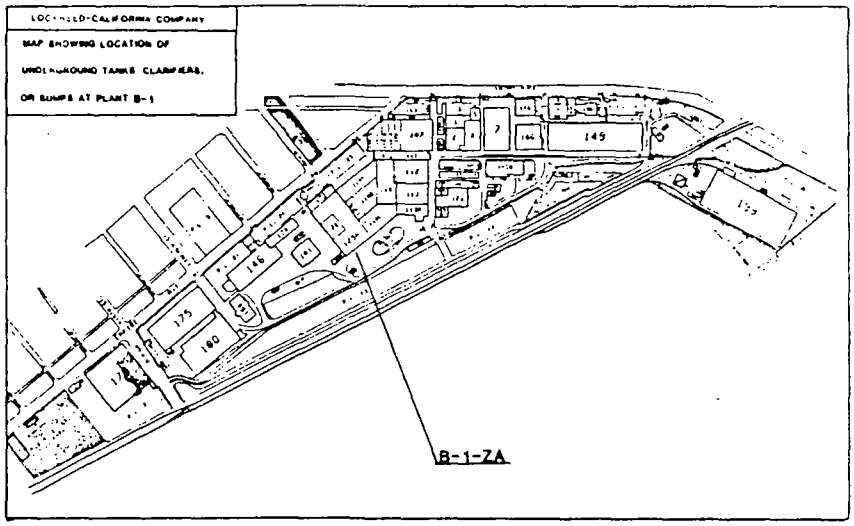
TABLE B-1-Z: RESULTS OF CHEMICAL ANALYSES

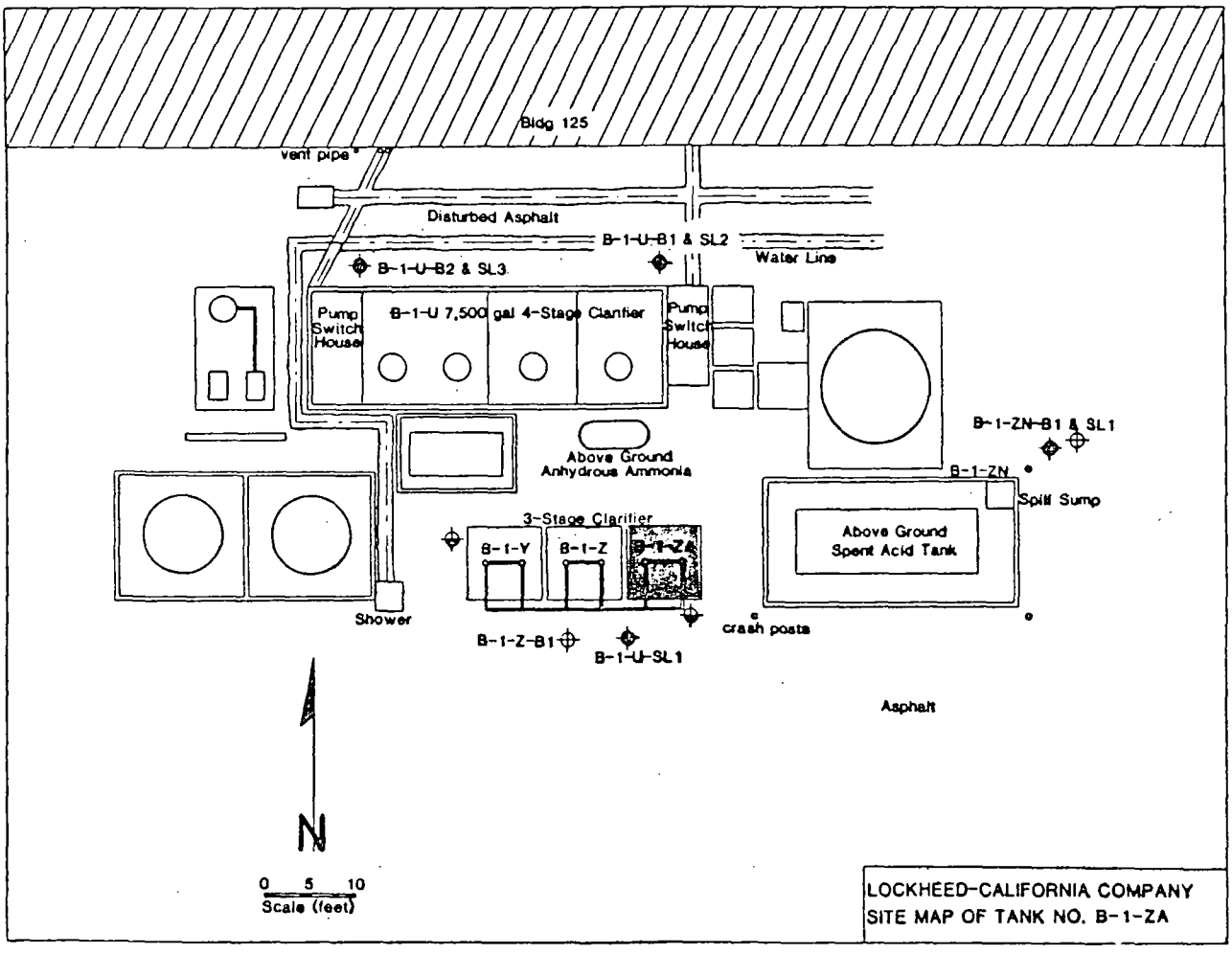
PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-Z B1 10 ft.	B-1-Z B1 20 ft.	B-1-Z B1 (COMP.) 30+40 ft.
Volatile Organics (ug/kg)		N.A.			N.D.
Benzene	<0.2		N.D.	N.D.	
Ethyl Benzene	<0.1		N.D.	N.D.	
Chloroform	<0.1		N.D.	N.D.	
Chloromethane	<0.2		N.D.	N.D.	
Chloroethane	<0.8		N.D.	N.D.	
1,1-Dichloroethane	<0.1		N.D.	N.D.	
1,2-Dichloroethane	<0.1		N.D.	N.D.	
1,2-Dichloropropane	<0.1		N.D.	N.D.	
1,1,1-Trichlorethane	<0.2		N.D.	N.D.	
1,1,2-Trichloroethane	<0.1		N.D.	N.D.	
Bromodichloromethane	<0.1		N.D.	N.D.	
Dibromochloromethane	<0.1		N.D.	N.D.	
1,1-Dichloroethene	<0.1		N.D.	N.D.	
trans-1,2-Dichloroethene	<0.1		N.D.	N.D.	
Trichloroethene	<0.3	* 2,040	N.D.	N.D.	
Tetrachloroethene	<0.4		N.D.	N.D.	
Toluene	<0.4		N.D.	N.D.	
Methyl Ethyl Ketone	<0.5		6.8	8.1	
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	<2.0	<2.0	<2.0
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.
CAM Metals (mg/kg)					
Antimony	<2.5	500	<2.5	<2.5	<2.5
Arsenic	13.4	500	18.0	7.16	13.6
Barium	91.9	10,000	103	44.4	96.3
Beryllium	<1.0	75	<1.0	<1.0	<1.0
Cadmium	<2.5	100	<2.5	<2.5	<2.5
Chromium (Total)	9.6	2,500	14.6	3.9	11.1
Cobalt	6.5	8,000	8.9	2.9	8.7
Copper	22.1	250	22.2	11.4	15.1
Lead	<2.5	1,000	4.38	<2.5	2.92
Mercury	<0.1	20	<1.0	<1.0	<1.0
Molybdenum	6.3	3,500	9.0	3.3	8.2
Nickel	8.4	2,000	13.3	4.4	10.9
Selenium	<2.5	100	<2.5	<2.5	<2.5
Silver	<2.5	500	<2.5	<2.5	<2.5
Thallium	<2.5	700	<2.5	<2.5	<2.5
Vanadium	22.0	2,400	31.7	9.2	26.9
Zinc	38.7	2,500	50.0	18.6	39.7
Others					
pH (standard units)	8.24	N.A.	8.63	8.49	8.52
Sodium (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.
Cyanide (mg/kg)	<0.2	N.A.	<0.2	<0.2	<0.2
Sulfate (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION
* mg/kg

TANK B-1-ZA

Tank B-1-ZA is the third stage of a three-stage clarifier. This clarifier is discussed under Tank B-1-Z, the center stage of the clarifier. The first stage, Tank B-1-Y, is also discussed under Tank B-1-Z.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZA


Bldg 125
vent pipe
Disturbed Asphalt
B-1-U-B1 & SL2
Water Line
B-1-U-B2 & SL3
Pump Switch House
B-1-U 7,500 gal 4-Stage Clarifier
Pump Switch House
B-1-ZN-B1 & SL1
B-1-ZN
Spill Sump
Above Ground Anhydrous Ammonia
3-Stage Clarifier
B-1-Y
B-1-Z
B-1-ZA
Above Ground Spent Acid Tank
Shower
crash posts
B-1-Z-B1
B-1-U-SL1
Asphalt
N
0 5 10
Scale (feet)
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZA

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-2A
Plant No./Nearest Bldg.		B-1/Bldg. 125A (S Side)
Tank:	Location	1705 Victory Place
	Installation Date	1980
	Capacity, gal.	4,400
	Use/Process	To be transfer clarifier containing process rinses
	Contents (past,CAS No.,date)	None
	(present,CAS No.)	Chromic acid 7664939 Sulfuric acid 7664939 Hydrofluoric acid
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Int. lined
	Status	In service 10/84
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Exempted
	Borings (No.)	0 (just in service)
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

FIELD PROGRAM

One boring was drilled to assess conditions surrounding clarifier, B-1-ZB. The boring was to be converted to a suction lysimeter according to the work plan. However, the soil was contaminated to the extent that in the interest of safety the hole was sealed prior to installation of a monitoring device.

Monitoring Installations - The boring was drilled slightly east of the approved location due to rig access problems. Both the actual and approved locations of the boring are indicated on the site map.

Sampling Intervals - Soil samples from the boring were to have been collected at depths of 5, 12, 17, 25 and 40 feet according to the work plan. However, the samples were shifted to depths of 5, 10, 15, 25 and 40 feet in order to expedite the sampling process. The sample at 15 was lost after the sand retainer and cap was damaged. Based on the absence of any layers of low permeability in the upper portions of the soil horizons, and the loose, highly conductive nature of the sands that predominate the lithology, it is unlikely that a slight variance in the sampled intervals will significantly after the chemical concentration profile of the soil.

Field Observations - The brown grey color and medium grain size of the sand remained consistent throughout the first 3 feet of the Boring. At 3 feet the sand became a variegated brown, coarse, very moist sand which continued to 40 feet. The occurrence of gravel and cobbles remained frequent throughout the boring.

Indications of possible contamination were based upon observations of odor, color moisture content and consistency of the soils. The soils from just below the surface to 15 feet had a slight odor indicating possible contamination. At 40 feet the odor, similar to that of tetrachloroethene became very strong. The vapors from the excavation was sufficient to initiate monitoring the breathing zone with a HNU PID meter. At 40 feet, the HNU readings averaged 550 ppm.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Individual depth samples were collected from B-1-ZB-B1 and analyzed for volatile organics, total chromium, and sodium. A composite of the samples collected from B-1-ZB-B1 was analyzed for total chromium, pH, sodium, cyanide, and sulfate. These analyses are in accordance with the Work Plan.

TANK NUMBER B-1-ZB supplement

ADDITIONAL INVESTIGATIONS

Clarifier B-1-ZB, a 3,000 gallon two-stage clarifier, was abandoned immediately after contamination was found in the adjacent soil November 9, 1984. On the day of the inspection (May 6, 1985) there was some residual liquid in the clarifer but not in sufficient quantity to prevent a visual inspection. The walls of the clarifier were found to be badly deteriorated. The various acidic liquids once contained in the clarifier have erroded the concrete matrix significantly, leaving the more chemically-resistant aggregate protruding from the remaining concrete. In the corner between the west and south walls, about midway down, there is a baseball-size hole completely through the clarifier (see attached Inspection Profiles). Because this is obviously a large conduit for leakage, further inspection for smaller cracks was unnecessary for the purpose of this investigation.

It is concluded that Clarifier B-1-ZB is leaking. The soil collected (November 9, 1984) near the clarifier contained low to moderate levels of chromium but very high concentrations of tetrachlorethene (PCE). Although the clarifier does not normally contain PCE, it was reported that historically the clarifier may have received periodic inflows of PCE. The inflows may have been the result of occasional pump switch failures at a nearby PCE degreaser unit.

In order to further characterize the high levels of PCE found during the initial drilling, a second boring was drilled near Clarifier B-1-ZB on June 11, 1985. The boring, Boring B-1-ZB-B2, was drilled to a depth of 74 feet at which point further penetratrion was blocked by large and numerous cobbles. There are several lithologic variations noted during drilling that seemed to correspond to different levels of contamination; as indicated by the relative strength of odors. The upper 28 feet generally was predominated by a medium-coarse, brown and grey loose sand with some cobbles and had a faint tetrachloroethene odor. At 30 feet there was a significant change to a pinkish brown, medium fine sand which had a very strong tetrachloroethene odor. This increase in odor is consistant with the increased liquid retention potential of finer-grained materials. Between 30 and 44 feet, the sand became increasingly coarse and less malodorous. At 44 feet the odor increased significantly. The vapor continued to be strong down to 70 feet, at which depth the sand had become very coarse and correspondingly the odor decreased.

TANK B-1-ZB (continued)

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZB. Moderate to very high levels of tetrachloroethene ranging from 4.9 ug/kg to 301,000 ug/kg (301 mg/kg) were found in the individual depth samples. All other volatile organic compounds were below the limits of detection. The levels of chromium, sodium, cyanide, sulfate, and pH in the composite sample, were below the detection limits or near the levels reported for the background samples. A low to moderate level of chromium was reported for the 10-foot soil sample collected from Boring B-1-ZB-B1. Soil samples collected from 10.5- and 25.5-foot depths were analyzed for sodium and a moderate level was found in the 10.5-foot sample (938 mg/kg). These data are presented in Appendix C.

Conclusions - Based on field observations (strong odor) and laboratory results, it is concluded that the soil around Clarifier B-1-ZB is highly contaminated with tetrachloroethene (particularly at the 40.5 foot depth) and that Clarifier B-1-ZB is probably leaking. Field observations indicated that the sump was badly corroded. It was reported that the clarifier had at one time received tetrachloroethene as a result of a pump failure at the adjacent tetrachloroethene degreaser unit. This suggests that the contamination may have come from the clarifier during the short time it contained tetrachloroethene. This is feasible given the deterioration of the concrete in the clarifier walls.

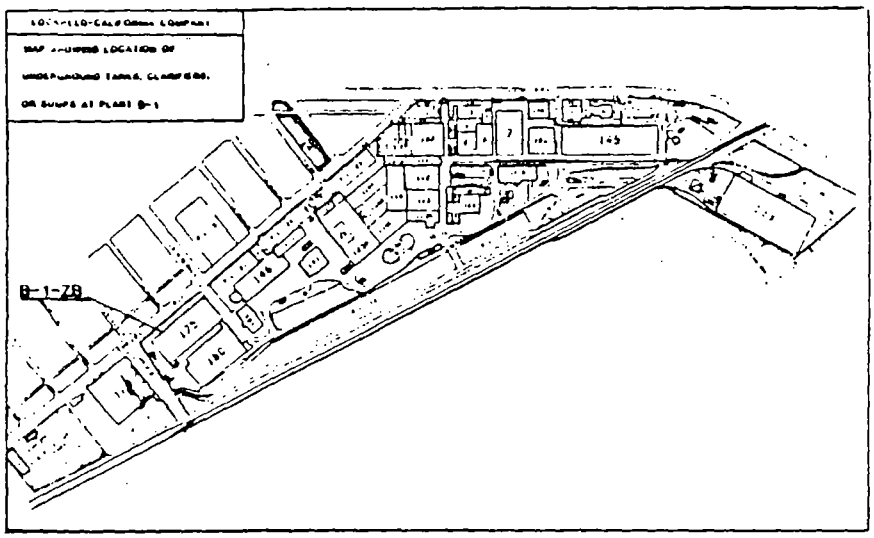
Recommendation - Additional drilling to depths beyond 40.5 feet is required for sample collection and analysis to determine why the tetrachloroethene contamination around Clarifier B-1-ZB occurs at this depth. The clarifier should be inspected for holes or cracks.

TANK NUMBER B-1-ZB supplement continued

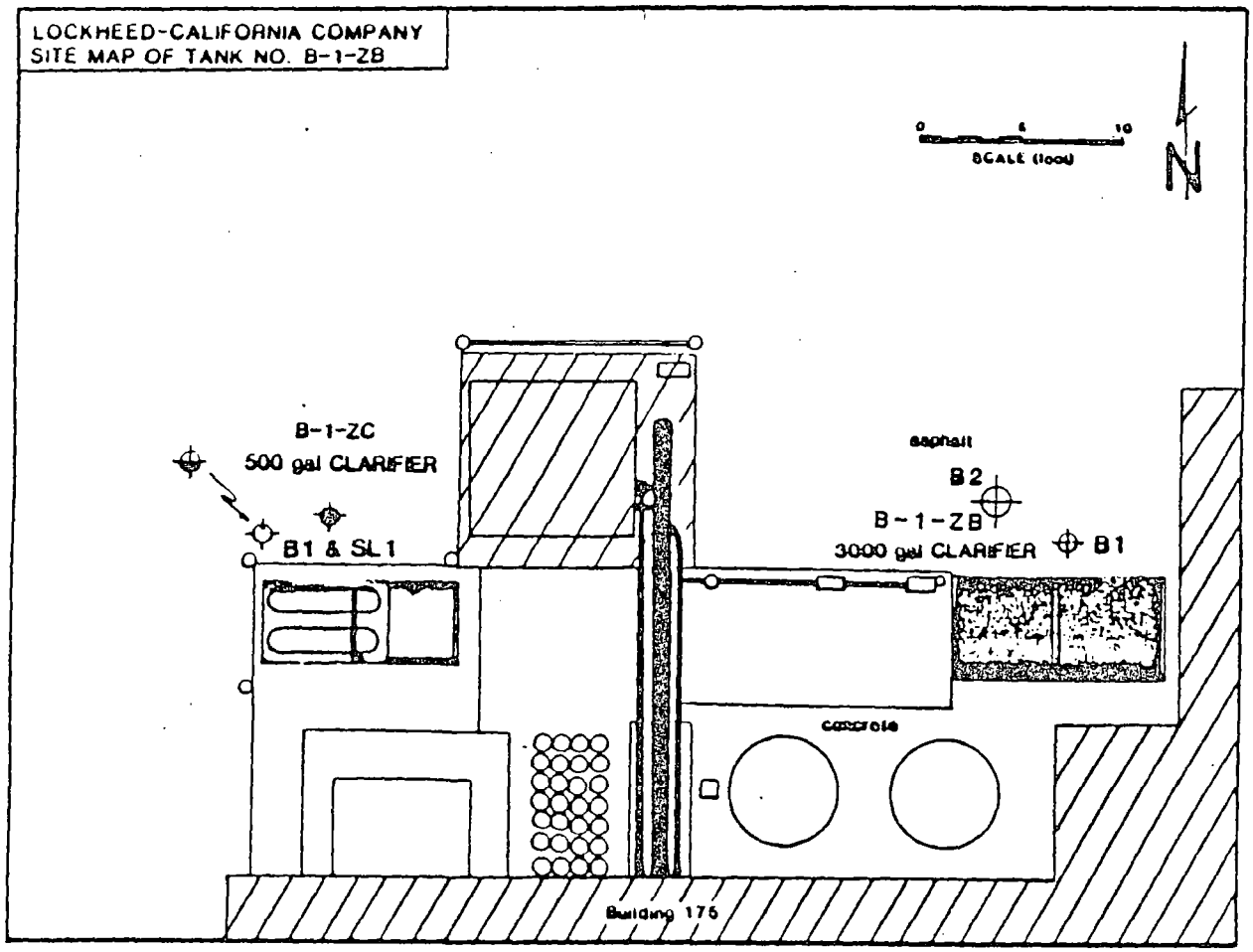
Soil samples were collected from Boring B-1-ZB-B2 at 10, 20, 30, 34.5, 40, 50, 60, and 70 feet and analyzed for volatile organic compounds according to US EPA Method 8240. Laboratory analysis results are summarized in Table B-1-ZB. Very high concentrations of 1,1,2-tetrachloroethane (140,000 and 1,500 ug/kg) were found in the samples collected at 30 and 60 feet, respectively. Moderate to very high concentrations of tetrachloroethene, ranging from 16 to 3,800,000 ug/kg, were found in the soil samples. High levels of acetone contamination (410 to 890 ug/kg) and low to moderate levels of benzene and toluene were found in the 10, 20, 40, and 50 foot samples. It is probable that low to high levels of acetone, benzene, and toluene contamination are present at depths of 30, 34.5, 60, and 70 feet. However, as very high concentrations of other organic compounds were present in samples collected from these depths, it became necessary for the laboratory analyst to dilute the samples by a factor of 10. Consequently, the levels of detection were raised from 5 to 500 ug/kg and concentrations below 500 ug/kg could not be accurately distinguished.

FURTHER RECOMMENDATIONS

The apparent severity of contamination near Clarifier B-1-ZB precludes corrective recommendations that would be premature and incomplete based on analysis of only two investigative borings. Additional drilling and testing (both physically and chemically) are being planned to characterize the vertical and lateral extent of contamination.

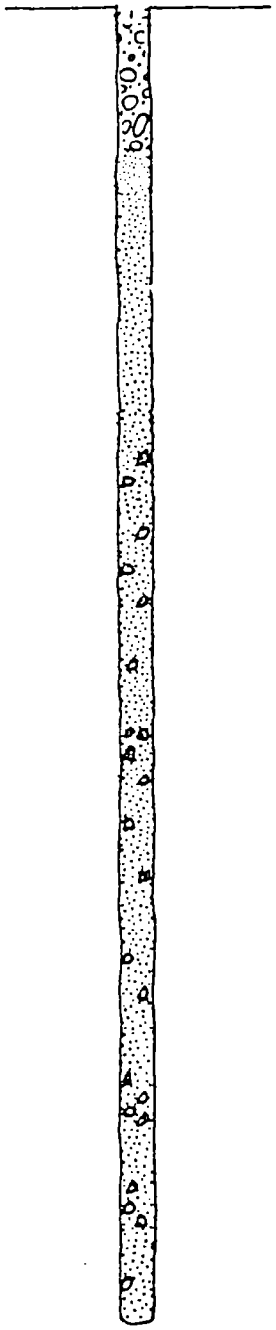


LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZB



PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		S-1-16
Plant No./Nearest Bldg.		S-17/Bldg. 175 in Site.
Tank:	Location	1705 Victory Place
	Installation Date	1942
	Capacity, gal.	3,000
	Use/Process	Metal cleaning rinse clarifier (2-stage)
	Contents (past,CAS No.,date)	None
	(Present,CAS No.)	Dilute sulfuric acid 7664939 Sodium dichromate 7789120
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	
	Depth to Invert	UNK
	Diameter	5 ft
	Length (1)	10.5 ft
	Containment	None
	Corrosive Protection (2)	Int. coated
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S.Auger Inspection
	Borings (No.)	2
	Sample Depths	B1/5,10,15,25,40 ft B2/10,20,30,34.5,40,50,60,70 ft
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	10, 1 (deep)
	Parameters	Cn,Cr,Na,pH,SO4 Vol.Org.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			-Asphalt
	- 2 -			-Sand,medium grain,brown-gray,very moist,w/gravel to small cobbles,slight odor
	- 4 -			
	- 6 -		34	-Color change at 3 ft Sand,coarse grain,brown-variegated,very moist, slight odor
	- 8 -			
	- 10 -		19	
	- 12 -			
	- 14 -			
	- 16 -		50+	-No odor
	- 18 -			-Frequent gravel
	- 20 -			
	- 22 -			
	- 24 -			
	- 26 -		50+	-Slight vapor
	- 28 -			
	- 30 -			
	- 32 -			-Vapor very strong
	- 34 -			
	- 36 -			
	- 38 -			
	- 40 -		50+	

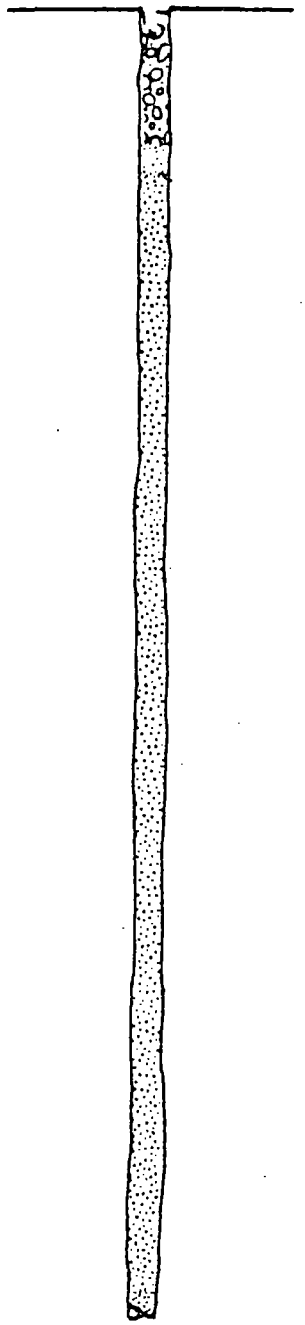
COMPLETION & BACKFILL

-Asphalt, 0-.5 ft
-Concrete, 0.5-5 ft
-Bentonite, 5-7 ft
-Clean sand,7-15 ft
-Native material, caved 15-40 ft

TANK NO. B-1-ZB

BORING NO. B-1-ZB-B1

GREGG & ASSOCIATES, INC.

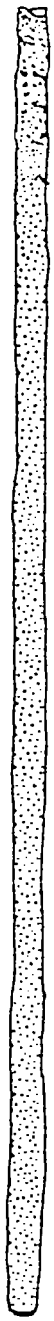


DEPTH	BLOW CNTS	LITHOLOGIC DESCRIPTION
- 0 -		Asphalt
		Sand, brown, medium coarse, moist, loose, soft, no odor some pea gravel
- 2 -		
- 4 -		
- 6 -		
- 8 -		At 8, very faint odor
- 10 -	16	Ring sample at 10
		Cobbles, 11-13
- 12 -		At 11, Sand, coarse, multicolored grey, moist loose, slight odor
- 14 -		
		Cobbles, 14-19
- 16 -		
- 18 -		
- 20 -	50	Ring sample at 20
- 22 -		
- 24 -		
- 26 -		Cobbles, 24-26
		Ring sample at 30
- 28 -		At 30, Silty sand, pinkish brown, medium fine,
- 30 -	17	moist, very strong odor, some calcite deposits
- 32 -		Cobbles, 32-34
		Ring sample at 34.5
- 34 -	50	At 34.5, Sand, grey brown, coarse, moist, loose, some
- 36 -		cobbles, strong odor
		Ring sample at 40
- 38 -		At 40, Sand, multicolored very coarse, moist, some
- 40 -		gravel, moderate odor

TANK NO. B-1-ZB

BORING NO. B-1-ZB-B2

GREGG & ASSOCIATES, INC.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 42 -			
	- 44 -			-At 44, Sand, brown, coarse, moist, loose, very strong odor
	- 46 -			
	- 48 -			
	- 50 -		50	Ring sample at 50
				-At 50, Sand, multicolored very coarse, soft, moist loose, many cobbles, strong odor
	- 52 -			
	- 54 -			
				-At 55, Sand, brown, medium to coarse, soft, moist, loose, very strong odor
	- 56 -			
	- 58 -			
	- 60 -		50	Ring sample at 60
				-At 60, Sand, multicolored medium, very soft, slightly moist, very strong odor
	- 62 -			
	- 64 -			-Cobbles, 64-67
	- 66 -			
	- 68 -			
	- 70 -		50	Ring sample at 70
				-At 70, Sand, multicolored medium coarse, soft, moist, loose, moderate to slight odor
	- 72 -			
	- 74 -			-Cobbles, 71-74
				-End of hole at 74

COMPLETION & BACKFILL
-Backfilled with sand and bentonite, 0-74

TANK NO. B-1-ZB

BORING NO. B-1-ZB-B2 (cont.)

GREGG & ASSOCIATES, INC.

TABLE B-1-ZB: RESULTS OF CHEMICAL ANALYSES

0837

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-ZB B1 5.5 ft.	B-1-ZB B1 10.5 ft.	B-1-ZB B1 25.5 ft.	B-1-ZB B1 (DUP.) 25.5 ft.	B-1-ZB B1 40.5 ft.	B-1-ZB B1 COMPOSITE
Volatile Organics (ug/kg)		N.A.						N.T.
Benzene	<0.2		N.D.	N.D.	N.D.	N.D.	N.D.	
Ethyl Benzene	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
Chloroform	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
Chloromethane	<0.2		N.D.	N.D.	N.D.	N.D.	N.D.	
Chloroethane	<0.8		N.D.	N.D.	N.D.	N.D.	N.D.	
1,1-Dichloroethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
1,2-Dichloroethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
1,2-Dichloropropane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
1,1,1-Trichlorethane	<0.2		N.D.	N.D.	N.D.	N.D.	N.D.	
1,1,2-Trichloroethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
Bromodichloromethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
Dibromochloromethane	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
1,1-Dichloroethene	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
trans-1,2-Dichloroethene	<0.1		N.D.	N.D.	N.D.	N.D.	N.D.	
Trichloroethene	<0.3	* 2,040	N.D.	N.D.	N.D.	N.D.	N.D.	
Tetrachloroethene	<0.4		4.9	61.0	14.2	13.1	301,000	
Toluene	<0.4		N.D.	N.D.	N.D.	N.D.	N.D.	
Methyl Ethyl Ketone	<0.5		N.D.	N.D.	N.D.	N.D.	N.D.	
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
CAM Metals (mg/kg)			N.T.	N.T.	N.T.	N.T.	N.T.	
Antimony	<2.5	500						N.T.
Arsenic	13.4	500						N.T.
Barium	91.9	10,000						N.T.
Beryllium	<1.0	75						N.T.
Cadmium	<2.5	100						N.T.
Chromium (Total)	9.6	2,500		39.5	3.9		14.6	11.3
Cobalt	6.5	8,000						N.T.
Copper	22.1	250						N.T.
Lead	<2.5	1,000						N.T.
Mercury	<0.1	20						N.T.
Molybdenum	6.3	3,500						N.T.
Nickel	8.4	2,000						N.T.
Selenium	<2.5	100						N.T.
Silver	<2.5	500						N.T.
Thallium	<2.5	700						N.T.
Vanadium	22.0	2,400						N.T.
Zinc	38.7	2,500						N.T.
Others			N.T.			N.T.	N.T.	
pH (standard units)	8.24	N.A.		N.T.	N.T.			8.69
Sodium (mg/kg)	402	N.A.		938	263			590
Cyanide (mg/kg)	<0.2	N.A.		N.T.	N.T.			<0.2
Sulfate (mg/kg)	<6	N.A.		N.T.	N.T.			11.0

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TABLE 6-1-16: RESULTS OF CHEMICAL ANALYSES - LOCKHEED UNDERGROUND TANK PROGRAM

0837

PARAMETER	DETECTION LIMIT	TTLC	6-1-16 B2 10 ft	6-1-16 B2 20 ft	6-1-16 B2 40 ft	6-1-16 B2 50 ft
Halogenated Volatile Organics (ug/kg)						
Bromodichloromethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Bromoform	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Bromomethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Carbon tetrachloride	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chlorobenzene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chloroethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chloroform	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
2-Chloroethyl vinyl ether	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chloromethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Dibromochloromethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,2-Dichlorobenzene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,3-Dichlorobenzene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,4-Dichlorobenzene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloroethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
trans-1,2-Dichloroethene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloropropane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
trans-1,3-Dichloropropene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Tetrachloroethene	5.0	N.A.	76	16	50	31
1,1,1-Trichloroethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,1,2-Trichloroethane	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Trichloroethene	5.0	2,400*	N.D.	N.D.	N.D.	N.D.
Vinyl Chloride	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Aromatic Volatile Organics (ug/kg)	5.0					
Benzene	5.0	N.A.	8	10	8	8
Chlorobenzene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Ethyl benzene	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Toluene	5.0	N.A.	14	N.D.	N.D.	N.D.
Acetone (ug/kg)	5.0	N.A.	670	670	500	410
Methyl Ethyl Ketone (ug/kg)	5.0	N.A.	N.D.	N.D.	N.D.	N.D.
Oil & Grease (mg/kg) EPA Method 413.2	1.0	N.A.	N.T.	N.T.	N.T.	N.T.
Metals (mg/kg)						
Chromium (total)	9.6**	2500	N.T.	N.T.	N.T.	N.T.
Lead (total)	2.5**	1000	N.T.	N.T.	N.T.	N.T.
Copper (total)	22.1**	250	N.T.	N.T.	N.T.	N.T.
Zinc (total)	38.7**	2500	N.T.	N.T.	N.T.	N.T.
pH (standard pH units)	6.24**	N.A.	N.T.	N.T.	N.T.	N.T.

* Milligrams per kilogram (mg/kg)

** Average Values Obtained From Background Concentrations

N.A. -Not Available; N.D. -Not Detected; N.T. -Not Tested

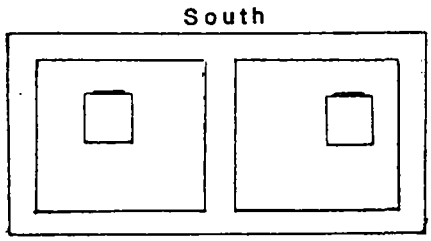
TABLE B-1-2B: RESULTS OF CHEMICAL ANALYSES - LOCKHEED UNDERGROUND TANK PROGRAM

PARAMETER	DETECTION LIMIT	TLC	B-1-2B B2 30 ft	B-1-2B B2 34.5 ft	B-1-2B B2 60 ft	B-1-2B B2 70 ft
Halogenated Volatile Organics (ug/kg)						
Bromodichloromethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Bromoform	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Bromomethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Carbon tetrachloride	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chlorobenzene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chloroethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chloroform	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
2-Chloroethyl vinyl ether	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chloromethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Dibromochloromethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,2-Dichlorobenzene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,3-Dichlorobenzene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,4-Dichlorobenzene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloroethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
trans-1,2-Dichloroethene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloropropane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
trans-1,3-Dichloropropene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,1,2,2-Tetrachloroethane	500.0	N.A.	140,000	N.D.	1,500	N.D.
Tetrachloroethene	500.0	N.A.	13,000,000	12,500	52,000	2,000
1,1,1-Trichloroethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
1,1,2-Trichloroethane	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Trichloroethene	500.0	2,400*	N.D.	N.D.	N.D.	N.D.
Vinyl Chloride	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Aromatic Volatile Organics (ug/kg)	500.0					
Benzene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Chlorobenzene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Ethyl benzene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Toluene	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Acetone (ug/kg)	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Methyl Ethyl Ketone (ug/kg)	500.0	N.A.	N.D.	N.D.	N.D.	N.D.
Oil & Grease (mg/kg) EPA method 413.2	1.0	N.A.	N.T.	N.T.	N.T.	N.T.
Metals (mg/kg)						
Chromium (total)	9.6**	2500	N.T.	N.T.	N.T.	N.T.
Lead (total)	3.5**	1000	N.T.	N.T.	N.T.	N.T.
Copper (total)	22.1**	250	N.T.	N.T.	N.T.	N.T.
Zinc (total)	38.7**	2500	N.T.	N.T.	N.T.	N.T.
pH (standard pH units)	8.2**	N.A.	N.T.	N.T.	N.T.	N.T.

* milligrams per kilogram (mg/kg)

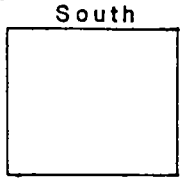
** Average values Obtained From Background Concentrations

N.A. -Not Available; N.D. -Not Detected; N.T. -Not Tested

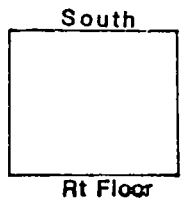


Top

Plate Steel Cover
With
Inspection Ports



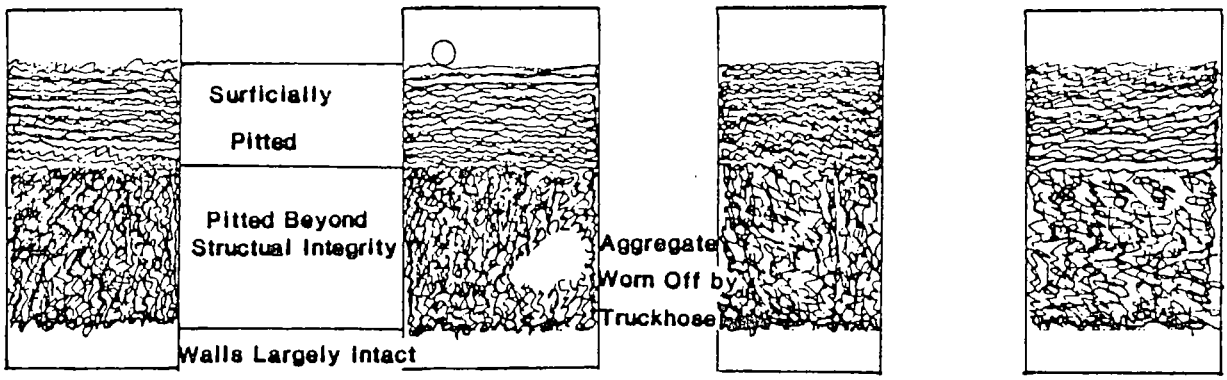
Lf Floor



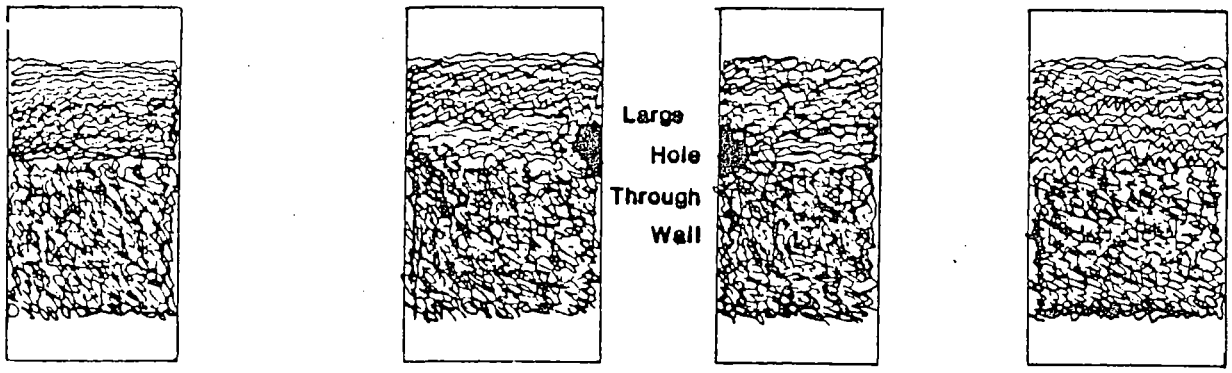
Rt Floor

Floors Covered With Sediment,
Presumably the Same Condition As the
Lowerwall

All Walls Exhibit the Same Sequence
of Degradation, Most Severe at Midwall



Lf East Wall | Lf South Wall | Lf West Wall | Lf North Wall



Rt East Wall | Rt South Wall | Rt West Wall | Rt North Wall

Scale 0 5 10
feet

LOCKHEED-CALIFORNIA COMPANY
Clarifier B1-ZB
Inspection Profiles

General Clarifier Condition: Very Poor

FIELD PROGRAM

One boring which was converted to a suction lysimeter was drilled/installed to assess conditions surrounding Clarifier B-1-ZC.

Monitoring Installations - Boring/Suction Lysimeter B-1-ZC-B1/SL1 was drilled/installed slightly north and east of the approved location due to rig access problems. Upon completion of the boring the hole was backfilled to 9 feet, at which level a lysimeter was installed. Both the actual and approved locations of the boring/suction lysimeter are indicated on the site map.

Sampling Intervals - Soil samples were taken from the boring/suction lysimeter at depths of 5, 12, 17, 25 and 40 feet, as approved in the work plan.

Field Observations - The dark brown color and medium to coarse grain size of the sand remained consistent throughout the first 5 feet of the boring/suction lysimeter. At 5 feet the sand became a light brown in color and had medium to fine grain size. At 17 feet the grain size of the sand was again medium to coarse. The occurrence of gravel and cobbles remained sporadic throughout the boring.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

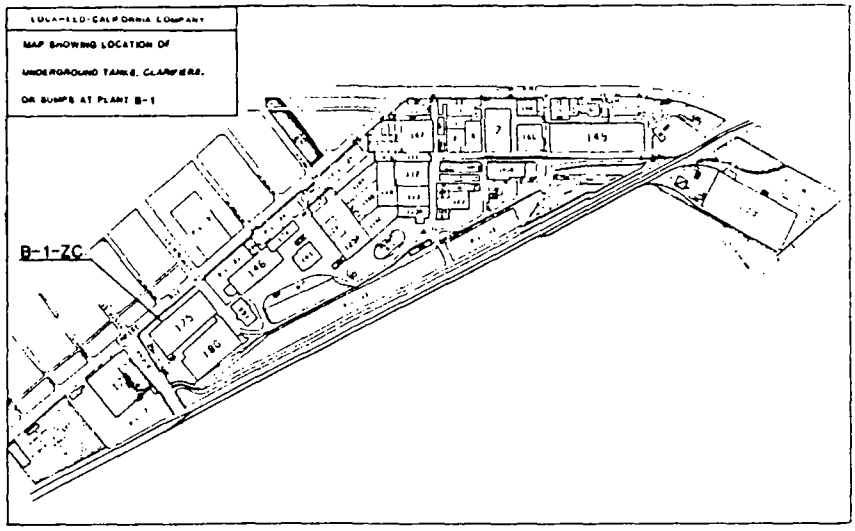
Laboratory Program - A liquid sample of the contents of Clarifier B-1-ZC was collected and analyzed for volatile organics. Soil samples collected from Boring B-1-ZC-B1, were composited and analyzed for total chromium, sodium, sulfate, and pH as approved in the Work Plan.

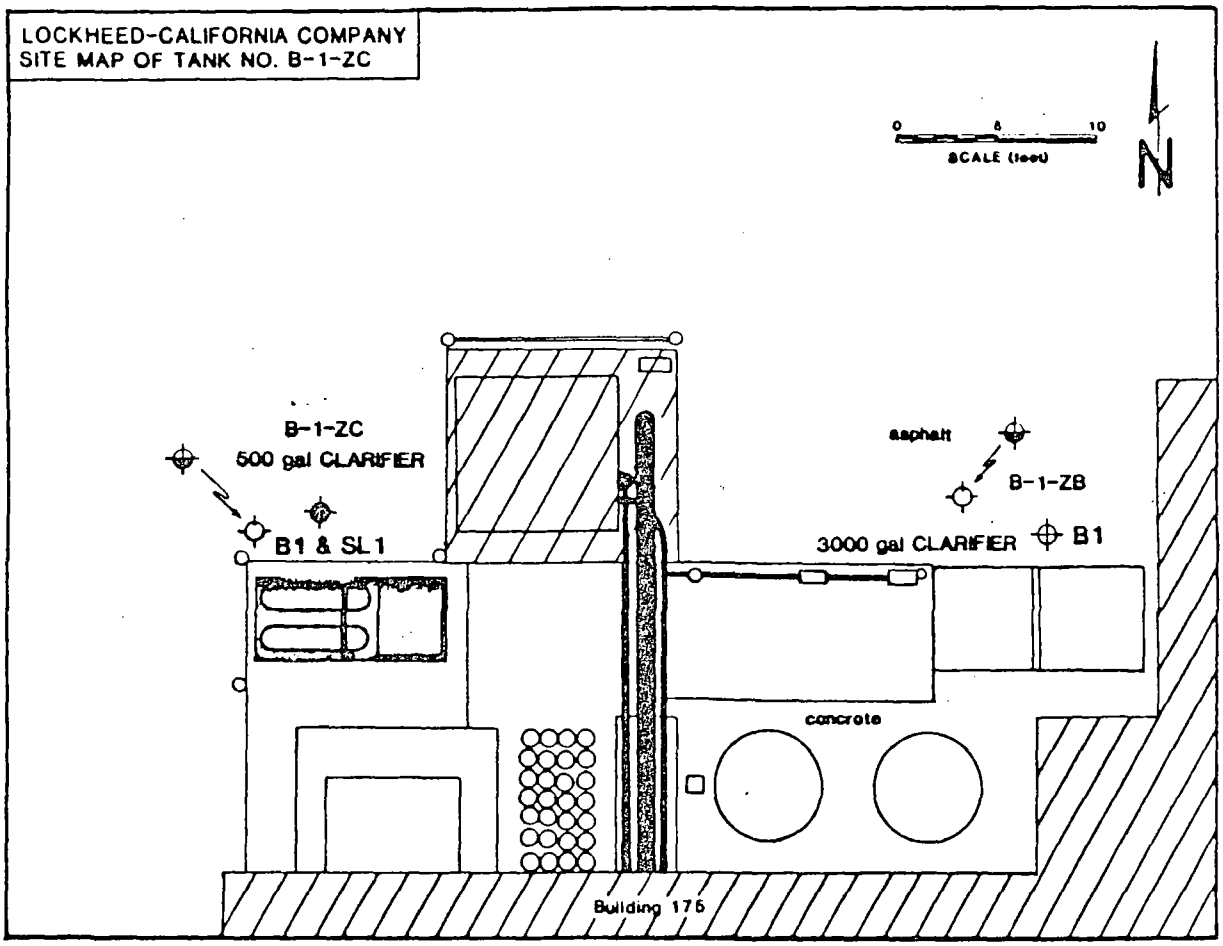
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZC. The liquid sample was reported to contain 4,490 ug/kg tetrachloroethene and trace levels of other organic compounds. Chromium, sodium, sulfate and pH levels in the soil composite were found to be low or near the levels reported for the background samples.

Conclusions - The original laboratory analysis program design was based upon the information that Clarifier B-1-ZC was used as a metal treatment transfer clarifier and contained sulfuric acid and sodium dichromate. Laboratory analyses did not indicate that high concentrations of sulfate, sodium, chromium, or pH were present in the soil samples. However, analysis of the liquid

sample collected from Clarifier B-1-ZC found high levels of tetrachloroethene and traces of other chlorinated solvents present, indicating that additional analysis of organic compounds should be performed on the soil samples. The proximity of this system to Tank B-1-ZB, where high levels of tetrachloroethene were also detected, suggests that the source of contamination is probably Tank B-1-ZB.

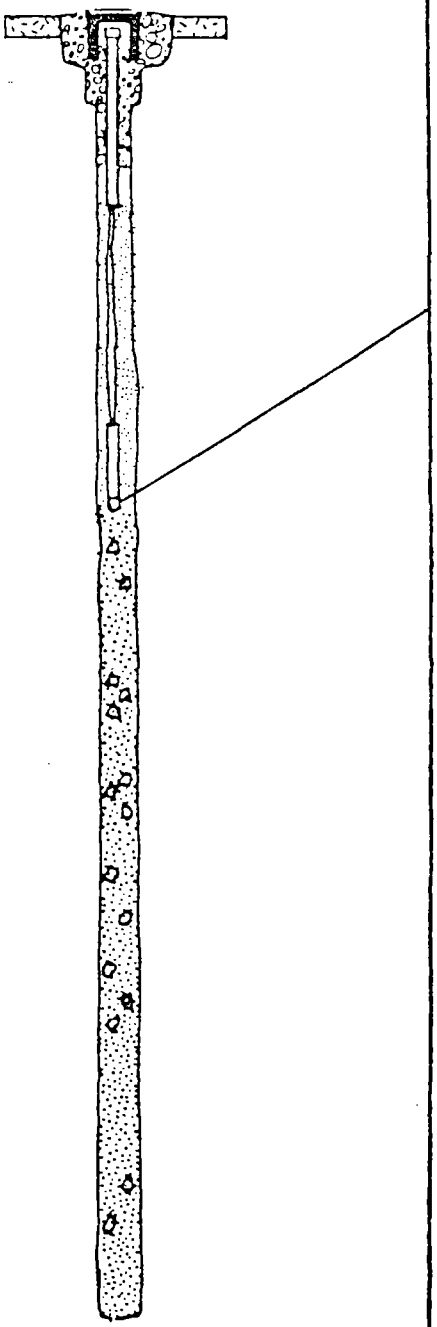
Recommendations - Additional sampling and depth-specific volatile organic analyses should be conducted to determine the extent of contamination present in the soils surrounding Clarifier B-1-ZC. Otherwise, proceed with quarterly monitoring of the suction lysimeter.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZC


LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZC
0
5
10
SCALE (feet)
N
B-1-ZC
500 gal CLARIFIER
B1 & SL1
asphalt
B-1-ZB
3000 gal CLARIFIER
B1
concrete
Building 176

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-2C
Plant No./Nearest Bldg.		B-1/Bldg. 175 (N Side)
Tank:	Location	1705 Victory Place
	Installation Date	1980
	Capacity, gal.	500
	Use/Process	Metal treatment transfer clarifier
	Contents (past,CAS No.,date)	Dilute sulfuric acid 7664939 Sodium dichromate 7789126
	(present,CAS No.)	Dilute sulfuric acid 7764939 Sodium dichromate 7764939
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	Int. coated
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S.Auger
	Borings (No.)	1
	Sample Depths	B1/5,12,17,25,40 ft
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	SL1/REF. TO B1
	Completion Interval	SL1/9 ft
Laboratory Program (4)		
	No. of Tank Content Samples	1
	Parameters	Vol.Org.
	No. of Tank Soil Samples	1(Comp.)
	Parameters	Cr,Na,pH,SO4

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		55 100 66 57 81	-Asphalt -Sand,medium to coarse grain,dark brown, w/gravel & cobbles -Sand,fine to medium grain,light brown -Sand,coarse grain, medium brown to variegated,moist, occasional gravel

COMPLETION & BACKFILL

-Suction Lysimeter at 9 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand & native mix, 5-18 ft
-Native material, caved 18-40 ft

TANK NO. B-1-ZC

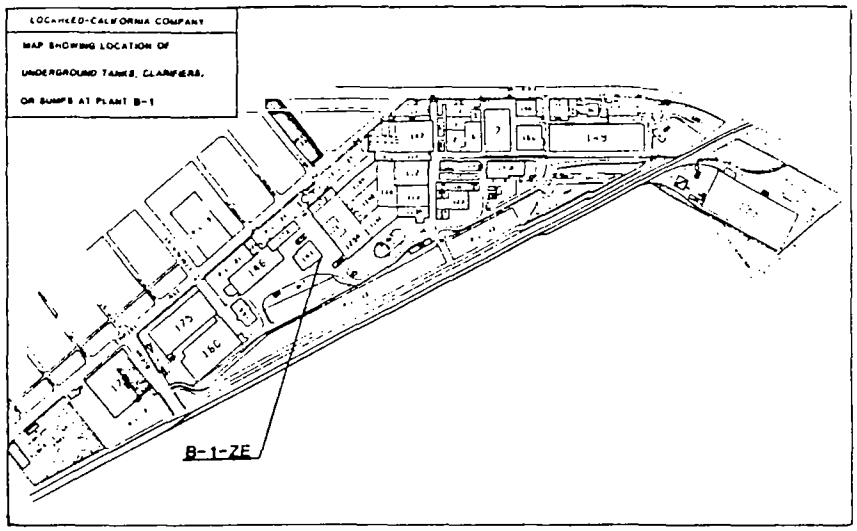
BORING NO. B-1-ZC-B1

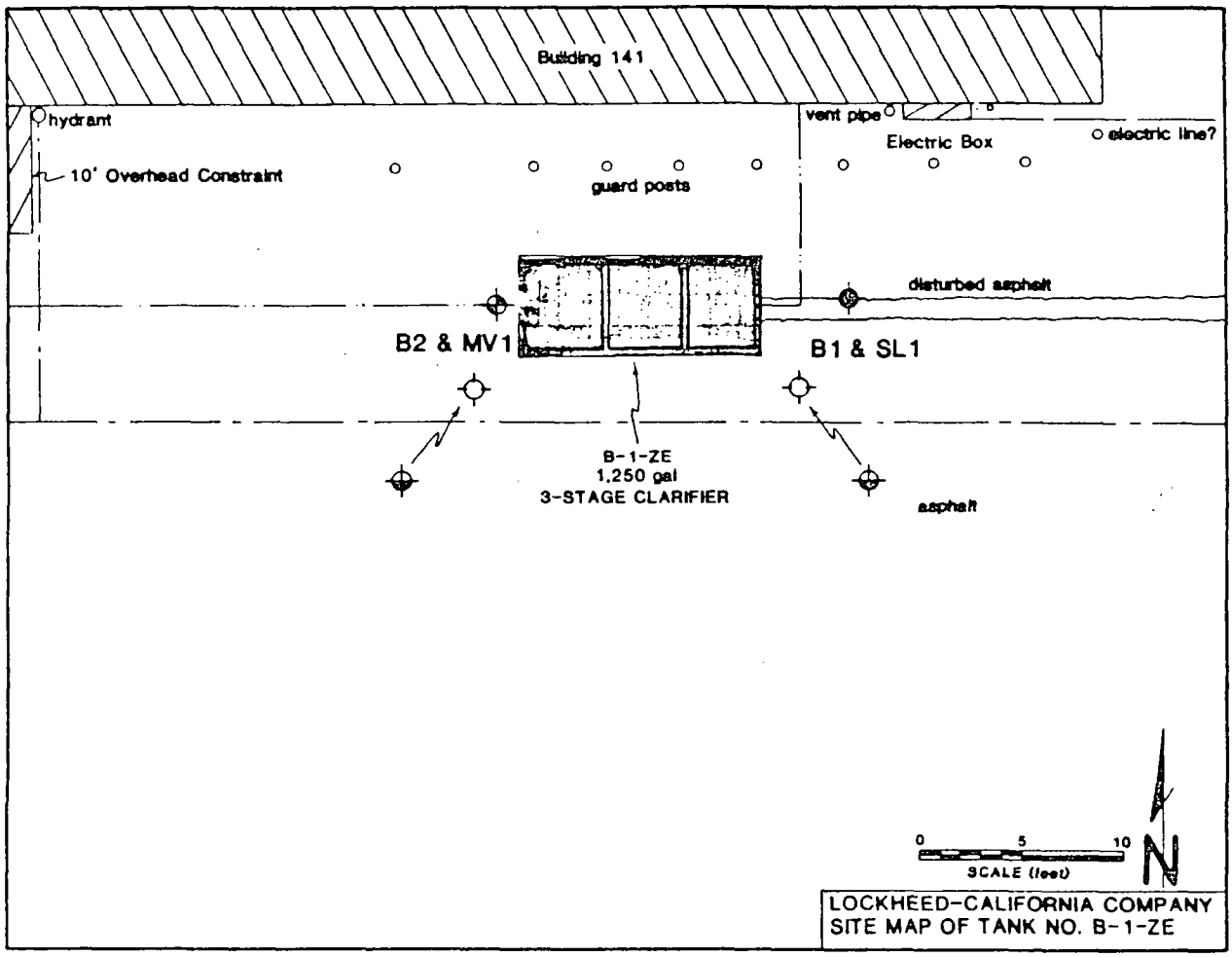
GREGG & ASSOCIATES, INC.

TABLE B-1-ZC: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-ZC LIQUID UNTREATED	B-1-ZC B1 COMPOSITE
Volatile Organics (ug/kg)		N.A.		N.T.
Benzene	<0.2		N.D.	
Ethyl Benzene	<0.1		N.D.	
Chloroform	<0.1		2.9	
Chloromethane	<0.2		N.D.	
Chloroethane	<0.8		N.D.	
1,1-Dichloroethane	<0.1		N.D.	
1,2-Dichloroethane	<0.1		N.D.	
1,2-Dichloropropane	<0.1		N.D.	
1,1,1-Trichloroethane	<0.2		N.D.	
1,1,2-Trichloroethane	<0.1		N.D.	
Bromodichloromethane	<0.1		N.D.	
Dibromochloromethane	<0.1		N.D.	
1,1-Dichloroethene	<0.1		N.D.	
trans-1,2-Dichloroethene	<0.1		2.4	
Trichloroethene	<0.3	* 2,040	2.5	
Tetrachloroethene	<0.4		4490	
Toluene	<0.4		N.D.	
Methyl Ethyl Ketone	<0.5		N.D.	
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.
CAM Metals (mg/kg)			N.T.	
Antimony	<2.5	500		N.T.
Arsenic	13.4	500		N.T.
Barium	91.9	10,000		N.T.
Beryllium	<1.0	75		N.T.
Cadmium	<2.5	100		N.T.
Chromium (Total)	9.6	2,500		5.7
Cobalt	6.5	8,000		N.T.
Copper	22.1	250		N.T.
Lead	<2.5	1,000		N.T.
Mercury	<0.1	20		N.T.
Molybdenum	6.3	3,500		N.T.
Nickel	8.4	2,000		N.T.
Selenium	<2.5	100		N.T.
Silver	<2.5	500		N.T.
Thallium	<2.5	700		N.T.
Vanadium	22.0	2,400		N.T.
Zinc	38.7	2,500		N.T.
Others			N.T.	
pH (standard units)	8.24	N.A.		8.44
Sodium (mg/kg)	402	N.A.		364
Cyanide (mg/kg)	<0.2	N.A.		N.T.
Sulfate (mg/kg)	<6	N.A.		11.0

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

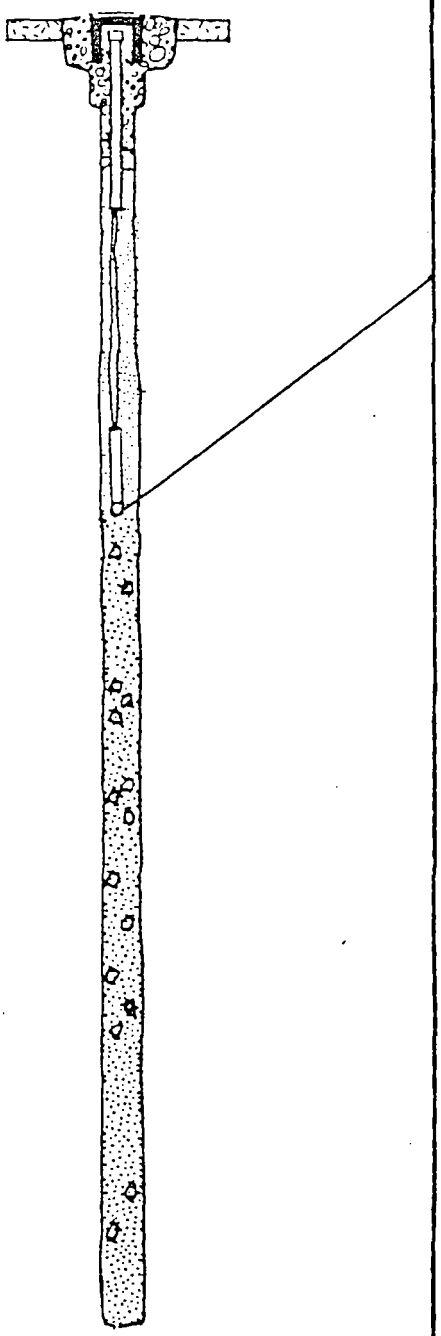

LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZE


Building 141
hydrant
10' Overhead Constraint
guard posts
vent pipe
Electric Box
electric line?
disturbed asphalt
B2 & MV1
B1 & SL1
B-1-ZE
1,250 gal
3-STAGE CLARIFIER
asphalt
0
5
10
SCALE (feet)
N
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZE

PERTINENT CONSTRUCTION AND PROGRAM DATA

0837

Tank No.		B-1-IE
Plant No./Nearest Bldg.		B-1/Bldg. 141 (SW Corner)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	1,250
	Use/Process	Paint residue processing clarifier (3-stage)
	Contents (past,CAS No.,date)	Paint residues
	(present,CAS No.)	Paint residues
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	5 ft width
	Length (1)	12 ft length
	Containment	None
	Corrosive Protection (2)	None
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S.Auger
	Borings (No.)	2
	Sample Depths	B1/5,10,20,30,40 ft B2/5,12,17,30,40 ft
	Vapor Wells/Lysimeter (No.)	2
	Sample Depths	SL1/REF. TO B1 MV1/REF. TO B2
	Completion Interval	SL1/8 ft MV1/6-9 ft
Laboratory Program (4)	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	2(Comp.)
	Parameters	Vol.Org. Hydrocarbons

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			Asphalt
	- 2 -			Sand,silty,brown
	- 4 -			
	- 6 -		13	
	- 8 -			Sand,medium to coarse grain,dark brown
	- 10 -		50+	
	- 12 -			
	- 14 -			
	- 16 -			
	- 18 -			
	- 20 -		50+	
	- 22 -			
	- 24 -			
	- 26 -			
	- 28 -			
	- 30 -		50+	Sand,fine grain,light brown
	- 32 -			
	- 34 -			
	- 36 -			
	- 38 -			
	- 40 -		50+	Sand,medium to coarse grain,brown

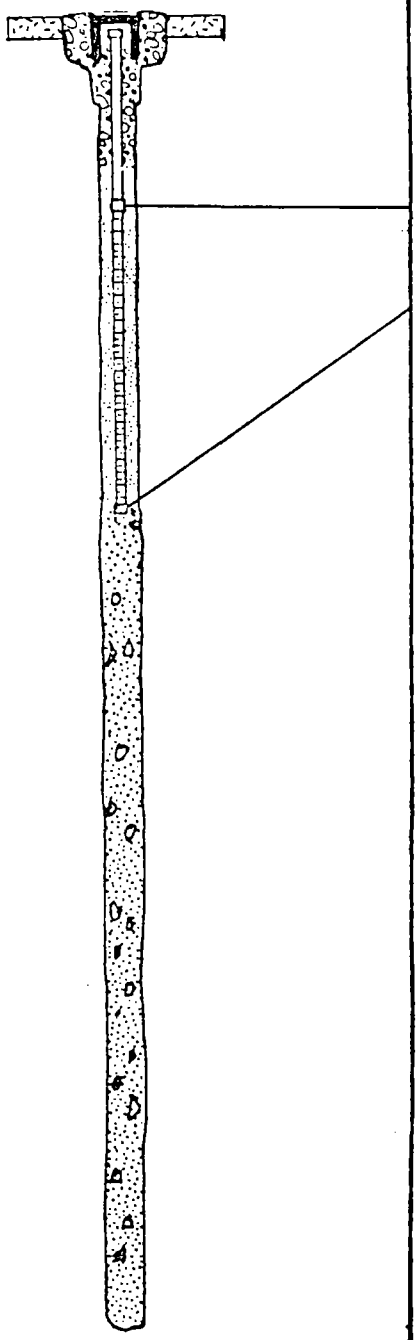
COMPLETION & BACKFILL

-Suction Lysimeter at 8 ft
-Blank 2-in I.D. 0-5 ft
-Concrete, 0-5 ft
-Bentonite, 4-5 ft
-Clean sand & native mix, 5-8 ft
-Native material, backfill 8-40 ft

TANK NO. B-1-ZE

BORING NO. B-1-ZE-B1

GREGG & ASSOCIATES, INC.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		20 50+ 40 27 40	Asphalt Sand, fine to coarse grain, brown, abundant gravel & cobbles to 6-in diameter, very well graded Sand, medium to coarse grain, variegated brown increasingly darker w/depth, w/small pebbles and occasional cobbles Cobble layer

COMPLETION & BACKFILL

- Blank 2-in I.D. PVC pipe, 0-6 ft
- Screened 2-in I.D. PVC pipe, 6-9 ft
- Concrete, 0-4 ft
- Bentonite, 4-6 ft
- Clean sand, 6-9 ft
- Native material, backfill 9-40 ft

TANK NO. B-1-ZE

BORING NO. B-1-ZE-B2

GREGG & ASSOCIATES, INC.

TABLE B-1-ZE: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-ZE B1 COMPOSITE	B-1-ZE B2 COMPOSITE
Volatile Organics (ug/kg)		N.A.		N.D.
Benzene	<0.2		N.D.	
Ethyl Benzene	<0.1		N.D.	
Chloroform	<0.1		13.4	
Chloromethane	<0.2		N.D.	
Chloroethane	<0.8		N.D.	
1,1-Dichloroethane	<0.1		N.D.	
1,2-Dichloroethane	<0.1		N.D.	
1,2-Dichloropropane	<0.1		N.D.	
1,1,1-Trichlorethane	<0.2		N.D.	
1,1,2-Trichloroethane	<0.1		N.D.	
Bromodichloromethane	<0.1		N.D.	
Dibromochloromethane	<0.1		N.D.	
1,1-Dichloroethene	<0.1		N.D.	
trans-1,2-Dichloroethene	<0.1		N.D.	
Trichloroethene	<0.3	* 2,040	N.D.	
Tetrachloroethene	<0.4		N.D.	
Toluene	<0.4		N.D.	
Methyl Ethyl Ketone	<0.5		N.D.	
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	<2	<2
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.
CAM Metals (mg/kg)			N.T.	N.T.
Antimony	<2.5	500		
Arsenic	13.4	500		
Barium	91.9	10,000		
Beryllium	<1.0	75		
Cadmium	<2.5	100		
Chromium (Total)	9.6	2,500		
Cobalt	6.5	8,000		
Copper	22.1	250		
Lead	<2.5	1,000		
Mercury	<0.1	20		
Molybdenum	6.3	3,500		
Nickel	8.4	2,000		
Selenium	<2.5	100		
Silver	<2.5	500		
Thallium	<2.5	700		
Vanadium	22.0	2,400		
Zinc	38.7	2,500		
Others			N.T.	N.T.
pH (standard units)	8.24	N.A.		
Sodium (mg/kg)	N.T.	N.A.		
Cyanide (mg/kg)	<0.2	N.A.		
Sulfate (mg/kg)	N.T.	N.A.		

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-ZE

FIELD PROGRAM

Two borings, one of which was converted to a suction lysimeter and the other converted to a vapor monitoring well, were drilled/installed to assess conditions surrounding clarifier B-1-ZE.

Monitoring Installations - Boring/Suction Lysimeter B-1-ZE-B1/SL1 was drilled/installed to monitor the clarifier slightly north of the approved location because it was possible to drill closer to the clarifier than what was previously anticipated. Upon completion, the boring was back filled to 8 feet where a lysimeter was installed. Both the actual and approved locations of the boring/suction lysimeter are indicated on the site map.

Sampling Intervals - Soil samples from the boring/suction lysimeter were to have been collected at depths of 8, 12, 18, 28 and 40 feet according to the work plan. However, to facilitate sampling the intervals were shifted to depths of 5, 10, 20, 30 and 40 feet. Based on the absence of any layers of low permeability in the upper portions of the soil horizons, and the loose, highly conductive nature of the sands that predominate the lithology, it is unlikely that a slight variance in the sampled intervals will significantly alter the chemical concentration profile of the soil.

Field Observations - The fine to very fine grain size of the sand remained consistent throughout the first 9 feet of the boring/suction lysimeter. At 9 feet the sand became coarser which corresponds to the color becoming dark brown at the same depth. The sand became finer and lighter in color again at 30 feet.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

Boring/Vapor Monitoring Well B-1-ZE-B2/MV1 was drilled/installed slightly north of the approved locations due to rig access problems. Upon completion, the boring was backfilled to a depth of 9 feet,, at which level a vapor monitoring well was placed. Both the actual and approved locations of the boring/vapor monitoring well are indicated on the site map.

Sampling Intervals - Soil samples from the boring/vapor monitoring well were to have been collected at depths of 8, 12, 18, 28 and 40 feet according to the work plan. However, to facilitate sampling the intervals were shifted to depths of 5,

12, 17, 30 and 40 feet.

Field Observations - The medium to fine grain size of the sand remained consistent throughout the first 10 feet of the boring. At 10 feet the sand became coarser which corresponds to the color change at the same depth. The soil was brown in color throughout the first 10 feet. At 10 feet the color changed from brown to variegated light brown which corresponds with a general grain size increase at the same depth. The frequency of cobbles increased at 10 feet and continued to 16 feet.

There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Soil samples were collected from Boring B-1-ZE-B1 and a composite was analyzed for volatile organic compounds and petroleum hydrocarbons. A composite of soil samples collected from Boring B-1-ZE-B2 was analyzed for volatile organic compounds and petroleum hydrocarbons. These analyses are in accordance with the work plan.

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZE. A moderate level of chloroform (13.4 ug/kg) was found in the composite sample B-1-ZE-B1. Concentrations of the remaining volatile organic compounds and petroleum hydrocarbons were below the limits of detection in this sample. Volatile organic compounds and petroleum hydrocarbons were found to be below the limits of detection in sample B-1-ZE-B2.

Conclusions - Laboratory results indicate that the soil around Boring B-1-ZE-B1 is contaminated with chloroform. The extent of contamination cannot be determined. Based upon the absence of any indications of contamination in the field during drilling, and the laboratory analyses, it is unlikely that Clarifier B-1-ZE is leaking.

Recommendation - Additional sampling and depth-specific analyses for volatile organic compounds should be conducted to determine the source of the chloroform contamination. In addition, CAM metals should be analyzed to determine whether any metal contamination exists.

TANK NUMBER B-1-ZF

FIELD PROGRAM

One 30-foot boring which was converted to a suction lysimeter was drilled/installed to assess conditions surrounding Clarifier B-1-ZF.

Monitoring Installations - Boring/Suction Lysimeter B-1-ZF-B1/SL1 was drilled/installed to monitor the clarifier as indicated in the approved work plan. Upon completion, the 30 foot boring was backfilled to 9 feet at which level a lysimeter was set. The location of the boring/suction lysimeter is indicated on the site map.

Sampling Intervals - Soil samples were taken from the boring/suction lysimeter at depths of 10, 15 and 20 feet. Soil samples were to have been extricated using a 3 inch modified california ring sampler; however, extremely limited access necessitated the use of a smaller rig with a 4 inch solid stem auger. It was therefore, not possible to use a down hole sampler, which requires an 8 inch hollow stem auger. The soil samples were taken directly from the auger flights at the surface. The auger cut samples are subject to volatilization. Further, they may represent soil from just below the surface to 10, 15 and 20 feet below respectively due to soil caving onto the auger flights from above.

Field Observations - The brown color and medium to coarse grain size of the sand remained consistent throughout the first 5 feet of the boring/suction lysimeter. At 5 feet the sand became darker in color. The frequency of gravel and cobbles increased at 25 feet and continued to 28 feet.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Soil samples collected from Boring B-1-ZF-SL1 were composited and analyzed for total chromium, cyanide, and pH, and individual-depth analyses for chromium and pH were conducted as approved in the Work Plan.

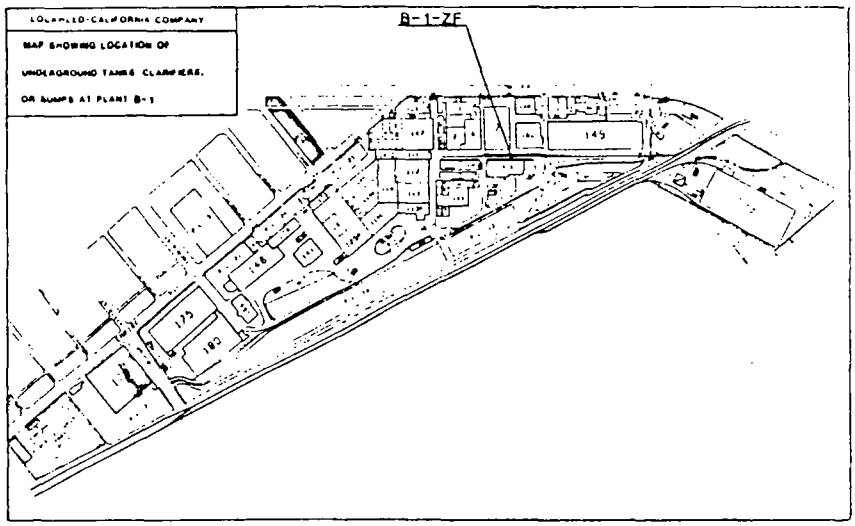
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZF. Chromium and cyanide concentrations were found to be below the level of detection or the levels reported for the background sample. A pH of 9.95 was reported for the composite sample which is approximately 1.7 pH units above the level reported for the background average. Levels of pH reported for the individual-depth samples ranged

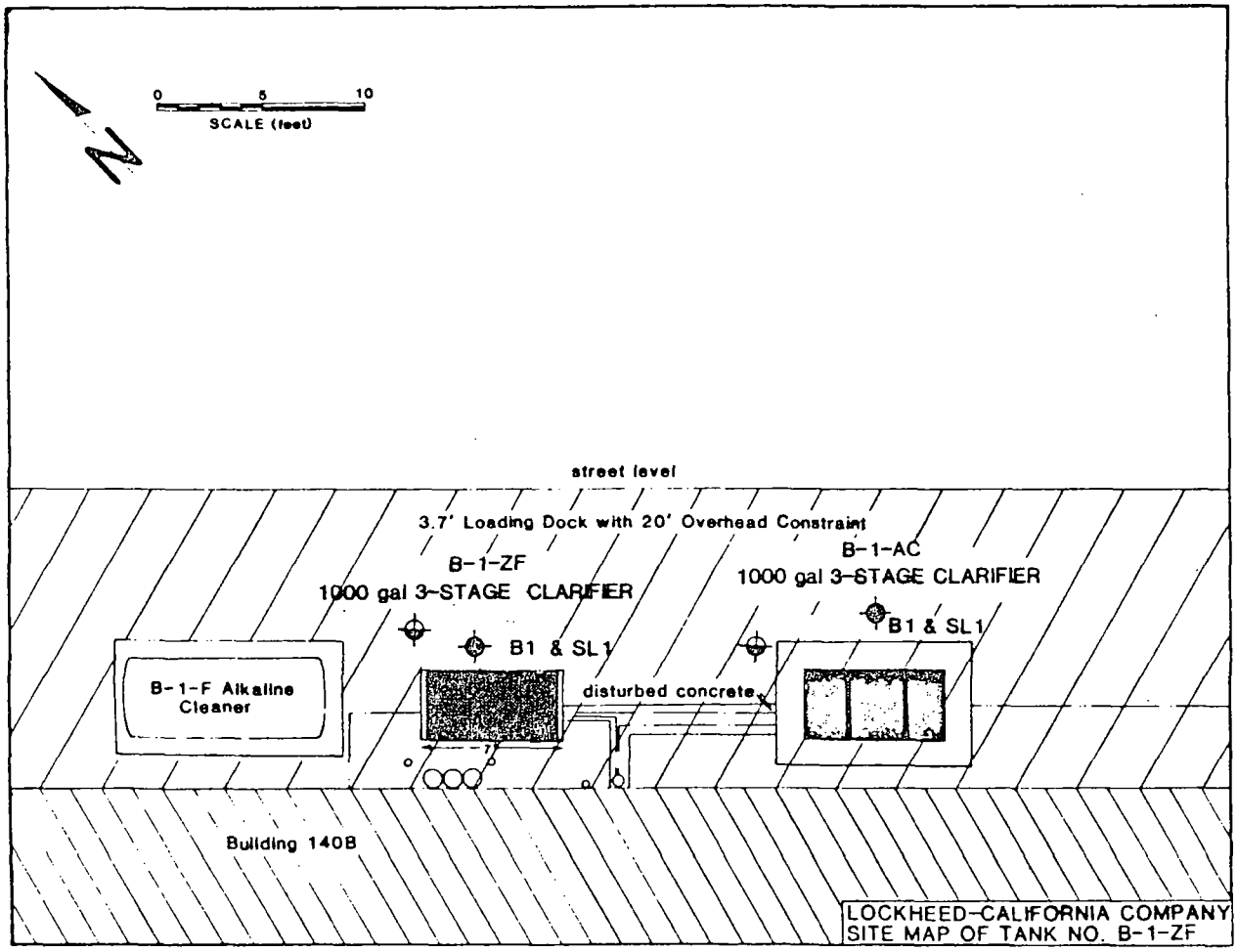
TANK B-1-ZF (continued)

from 9.36 to 10.0 (data are presented in Appendix C). The high pH indicates that the soils around Clarifier B-1-ZF are alkaline. Since the clarifier contains acid, it is likely that Clarifier B-1-ZF is not leaking.

Conclusions - Based on field observations and laboratory analyses, it is concluded that Clarifier B-1-ZF is not leaking.

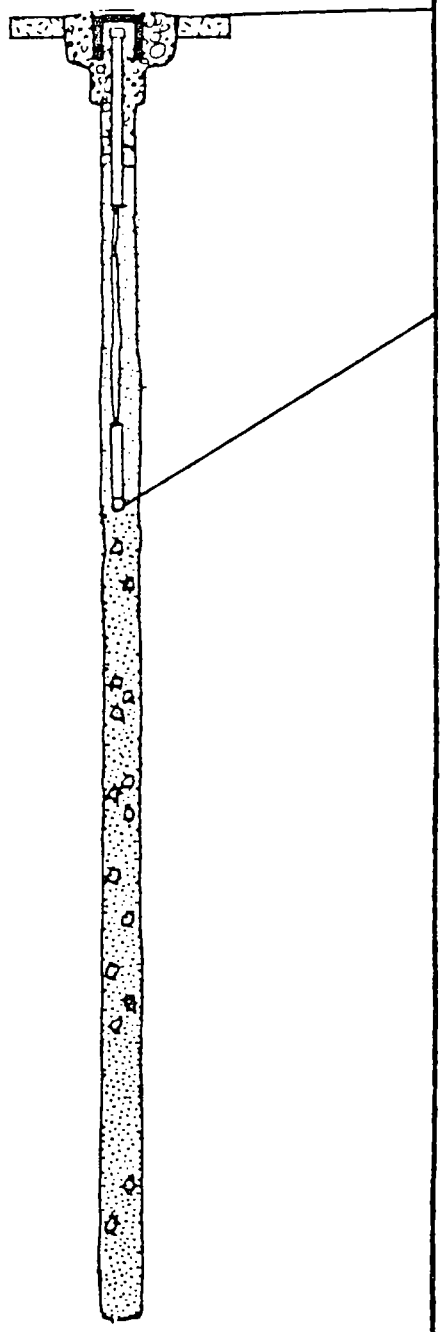
Recommendation - Proceed with quarterly monitoring of the suction lysimeter.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZF


N
0
5
10
SCALE (feet)
street level
3.7' Loading Dock with 20' Overhead Constraint
B-1-ZF
1000 gal 3-STAGE CLARIFIER
B-1-AC
1000 gal 3-STAGE CLARIFIER
B1 & SL1
B1 & SL1
B-1-F Alkaline Cleaner
disturbed concrete
Building 1408
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZF

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-2F
Plant No./Nearest Bldg.		B-1/Bldg. 140B (N Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	1,000
	Use/Process	Clarifier (3-stage)
	Contents (past, CAS No., date)	Dilute chromic acid 82704221
	(present, CAS No.)	Dilute chromic acid 82704221
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	4 ft deep
	Diameter	3.3 ft width
	Length (1)	7 ft length
	Containment	None
	Corrosive Protection (2)	None
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Concrete
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	S.S.Auger
	Borings (No.)	1
	Sample Depths	B1/10,15,28 ft Jar
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	SL1/REF. TO B1
	Completion Interval	SL1/9 ft
Laboratory Program (4)	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	1(Comp.)
	Parameters	pH,Cr,CN

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		Jar Jar Jar	-Concrete, loading dock -Artificial fill: Sand, medium to coarse grain, brown, w/gravel to small cobbles -Color change, slightly darker occasional cobbles, subangular -Some gravel, 1-in diameter

COMPLETION & BACKFILL

-Suction Lysimeter at 9 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-6 ft
-Clean sand & native mix, 6-10 ft
-Native material, backfill 10-30 ft

TANK NO. B-1-ZF

BORING NO. B-1-ZF-B1

GREGG & ASSOCIATES, INC.

TABLE B-1-ZF: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-ZF SL1 COMPOSITE
Volatile Organics (ug/kg)		N.A.	N.T.
Benzene	<0.2		
Ethyl Benzene	<0.1		
Chloroform	<0.1		
Chloromethane	<0.2		
Chloroethane	<0.8		
1,1-Dichloroethane	<0.1		
1,2-Dichloroethane	<0.1		
1,2-Dichloropropane	<0.1		
1,1,1-Trichlorethane	<0.2		
1,1,2-Trichloroethane	<0.1		
Bromodichloromethane	<0.1		
Dibromochloromethane	<0.1		
1,1-Dichloroethene	<0.1		
trans-1,2-Dichloroethene	<0.1		
Trichloroethene	<0.3	* 2,040	
Tetrachloroethene	<0.4		
Toluene	<0.4		
Methyl Ethyl Ketone	<0.5		
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.
CAM Metals (mg/kg)			
Antimony	<2.5	500	N.T.
Arsenic	13.4	500	N.T.
Barium	91.9	10,000	N.T.
Beryllium	<1.0	75	N.T.
Cadmium	<2.5	100	N.T.
Chromium (Total)	9.6	2,500	8.5
Cobalt	6.5	8,000	N.T.
Copper	22.1	250	N.T.
Lead	<2.5	1,000	N.T.
Mercury	<0.1	20	N.T.
Molybdenum	6.3	3,500	N.T.
Nickel	8.4	2,000	N.T.
Selenium	<2.5	100	N.T.
Silver	<2.5	500	N.T.
Thallium	<2.5	700	N.T.
Vanadium	22.0	2,400	N.T.
Zinc	38.7	2,500	N.T.
Others			
pH (standard units)	8.24	N.A.	9.95
Sodium (mg/kg)	N.T.	N.A.	N.T.
Cyanide (mg/kg)	<0.2	N.A.	<0.05
Sulfate (mg/kg)	N.T.	N.A.	N.T.

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-ZG

FIELD PROGRAM

One boring which was converted to a suction lysimeter was drilled/installed to assess conditions surrounding Clarifier B-1-ZG.

Monitoring Installations - Boring/Suction Lysimeter B-1-ZG-B1/SL1 was drilled/installed south and west of the approved location due to rig access problems. Upon completion, the boring was backfilled to 9 feet where a lysimeter was installed. Both the actual and approved locations of the boring/suction lysimeter are indicated on the site map.

Sampling Intervals - Soil samples were taken from the boring/suction lysimeter at depths of 5, 10, 15, 25 and 40 feet, as approved in the work plan.

Field Observations - The grey color and medium grain size of the sand remained consistent throughout the first 23 feet of the boring/suction lysimeter. At 23 feet the sand became coarser and the color became lighter brown. The soil becam grey again between 35 and 40 feet. The frequency of cobbles increased at 6 feet and continued to 7 feet. Cobbles increased again between 31 and 32 feet and between 33 and 34 feet.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. The soil from just below the surface to 40 feet had a slight odor indicating possible contamination.

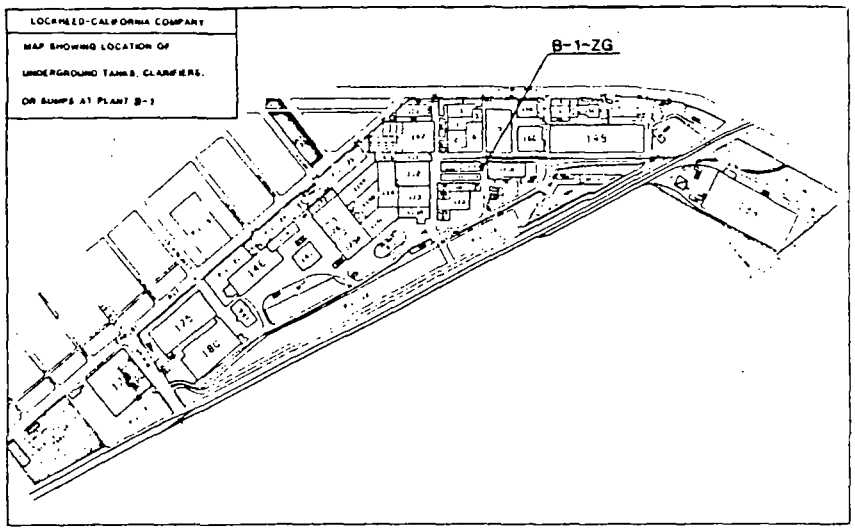
LABORATORY PROGRAM AND ANALYSIS

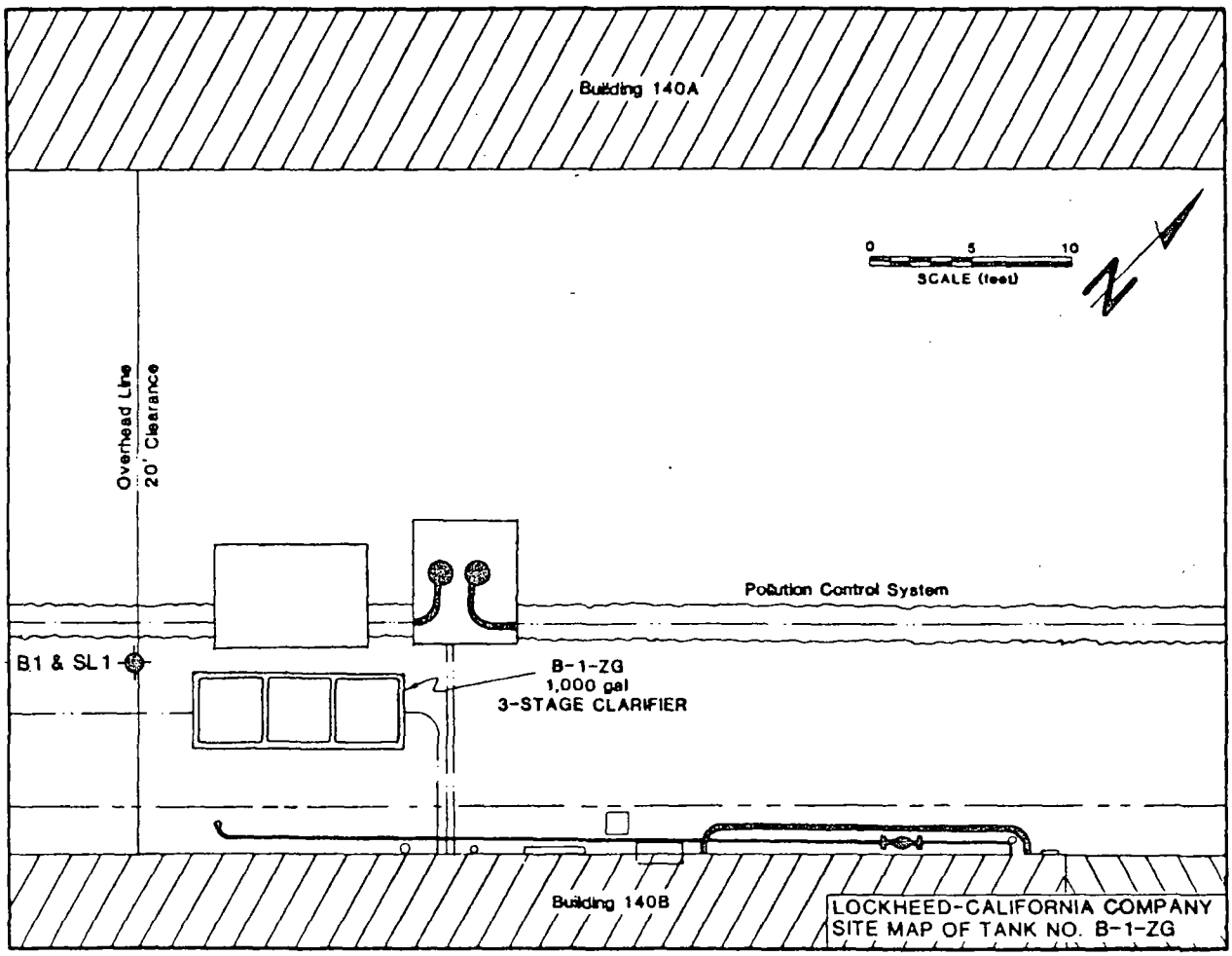
Laboratory Program - Individual depth soil samples were collected from Boring B-1-ZG-B1 and analyzed for total chromium, cyanide, and pH as approved in the work plan.

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZG. Total chromium, cyanide, and pH levels in each of the individual depth samples were found to be below the levels of detection or near the levels reported for the background samples.

Conclusions - Based on field observations and laboratory analyses, it is concluded that Clarifier B-1-ZG is not leaking.

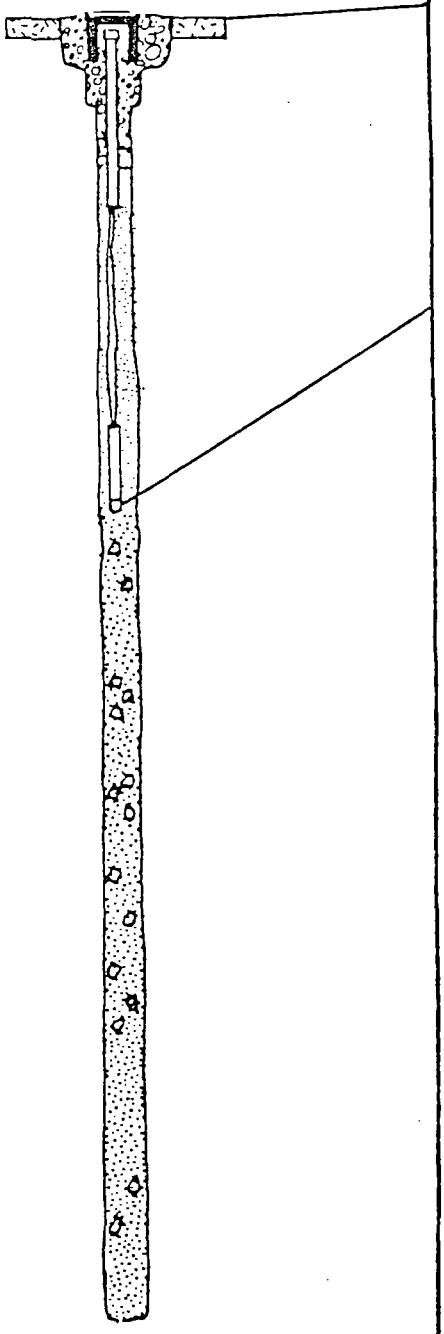
Recommendation - Proceed with quarterly monitoring of the suction lysimeter.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZG


Building 140A
0
5
10
SCALE (feet)
N
Overhead Line
20' Clearance
Pollution Control System
B1 & SL1
B-1-ZG
1,000 gal
3-STAGE CLARIFIER
Building 140B
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZG

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-26
Plant No./Nearest Bldg.		B-1/Bldg. 140B (NW Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	1,000
	Use/Process	Plating/cleaning process clarifier (3-stage)
	Contents (past, CAS No., date)	Dilute chromic acid 82704221
	(present, CAS No.)	Dilute chromic acid 82704221
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	3.3 ft width
	Length (1)	10.4 ft length
	Containment	None
	Corrosive Protection (2)	None
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	Unk
Drilling Program:	Rig Type/Requirements (3)	H.S.Auger
	Borings (No.)	1
	Sample Depths	B1/5,10,15,25,40 ft
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	SL1/REF. TO B1
	Completion Interval	SL1/9 ft
Laboratory Program (4)	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	5
	Parameters	pH, Cr, CN

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			-Asphalt -Sand,fine to medium grain,gray,w/cobbles to 4-in diameter
	- 2 -			
	- 4 -			
	- 6 -		26	-Cobble layer -Unfamiliar odor
	- 8 -			
	- 10 -		28	
	- 12 -			
	- 14 -			
	- 16 -		32	-Color change,Sand, coarse,lighter gray, variegated,loose, odor continues
	- 18 -			
	- 20 -			
	- 22 -			
	- 24 -			-Becoming more coarse, very light gray,faint odor
	- 26 -		50+	
	- 28 -			
	- 30 -			
	- 32 -			-Cobble layer
	- 34 -			-Cobble layer
	- 36 -			-Color change back to gray
	- 38 -			
	- 40 -		30	

COMPLETION & BACKFILL

-Suction Lysimeter at 9 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-5 ft
-Bentonite, 5-6 ft
-Clean sand, 6-7 ft
-Clean sand & native mix, 7-10 ft
-Native material, caved 10-40 ft

TANK NO. B-1-ZG

BORING NO. B-1-ZG-B1

GREGG & ASSOCIATES, INC.

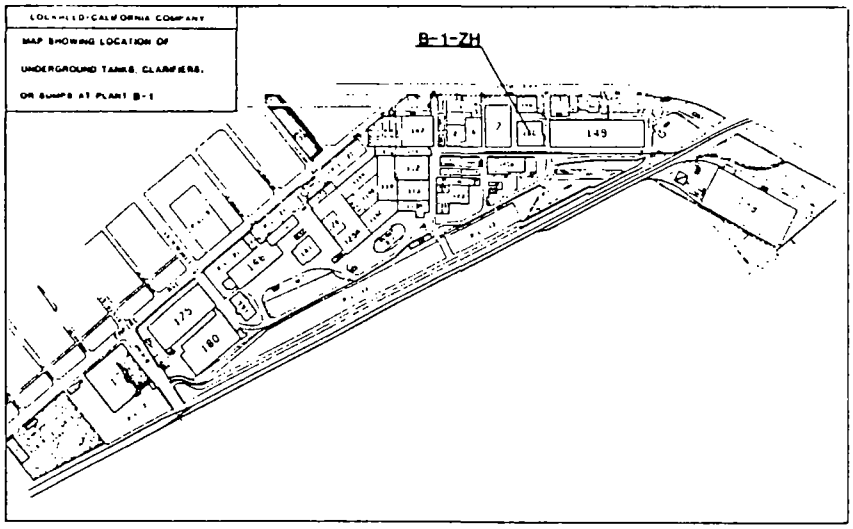
TABLE B-1-Z6: RESULTS OF CHEMICAL ANALYSES

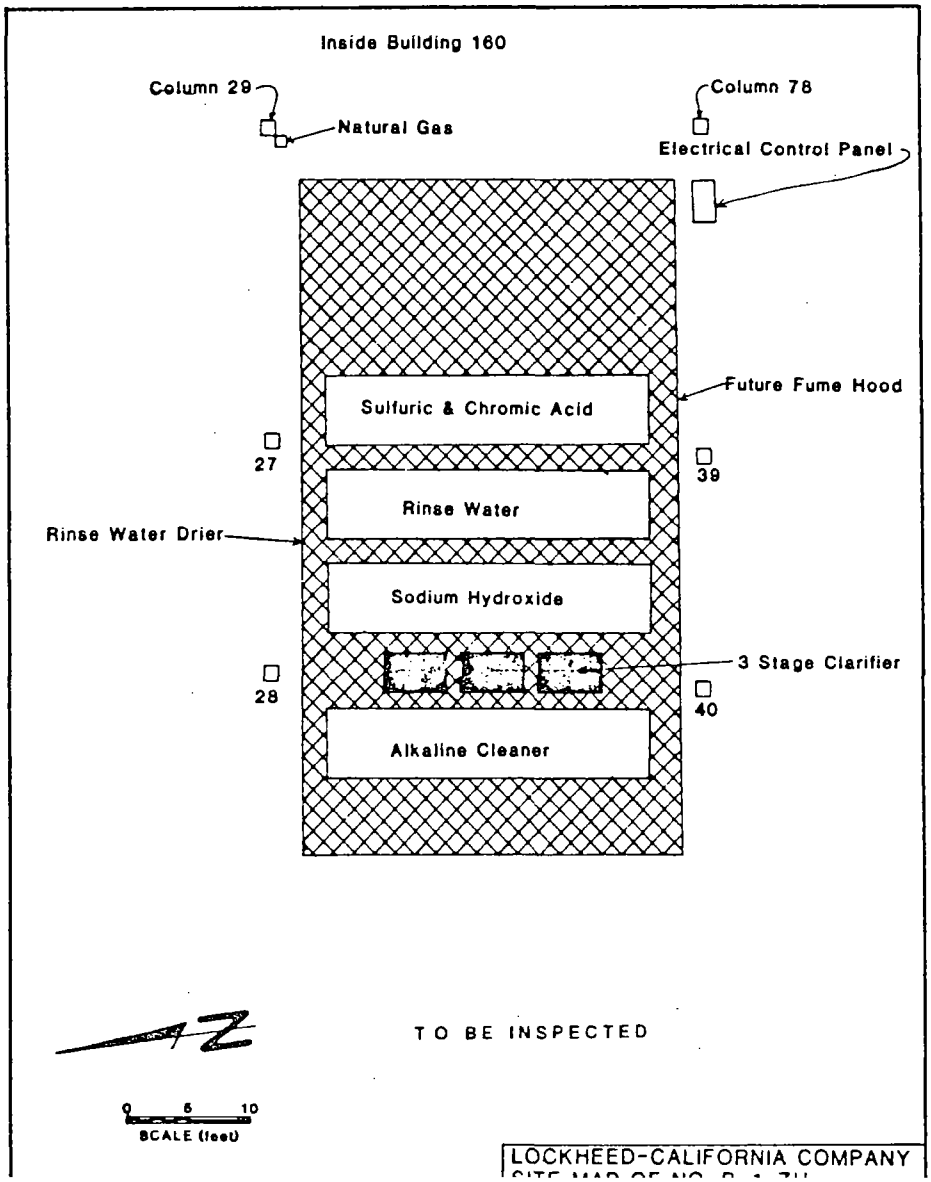
PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-Z6 B1 5 ft.	B-1-Z6 B1 10 ft.	B-1-Z6 B1 15 ft.	B-1-Z6 B1 25 ft.	B-1-Z6 B1 40 ft.
Volatile Organics (ug/kg)		N.A.	N.T.	N.T.	N.T.	N.T.	N.T.
Benzene	<0.2						
Ethyl Benzene	<0.1						
Chloroform	<0.1						
Chlorobenzene	<0.2						
Chloroethane	<0.8						
1,1-Dichloroethane	<0.1						
1,2-Dichloroethane	<0.1						
1,2-Dichloropropane	<0.1						
1,1,1-Trichlorethane	<0.2						
1,1,2-Trichloroethane	<0.1						
Bromodichloromethane	<0.1						
Dibromochloromethane	<0.1						
1,1-Dichloroethene	<0.1						
trans-1,2-Dichloroethene	<0.1						
Trichloroethene	<0.3	± 2,040					
Tetrachloroethene	<0.4						
Toluene	<0.4						
Methyl Ethyl Ketone	<0.5						
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.
CAM Metals (mg/kg)			N.T.	N.T.	N.T.	N.T.	N.T.
Antimony	<2.5	500	N.T.	N.T.	N.T.	N.T.	N.T.
Arsenic	13.4	500	N.T.	N.T.	N.T.	N.T.	N.T.
Barium	91.9	10,000	N.T.	N.T.	N.T.	N.T.	N.T.
Beryllium	<1.0	75	N.T.	N.T.	N.T.	N.T.	N.T.
Cadmium	<2.5	100	N.T.	N.T.	N.T.	N.T.	N.T.
Chromium (Total)	9.6	2,500	1.2	6.0	2.6	1.0	3.8
Cobalt	6.5	8,000	N.T.	N.T.	N.T.	N.T.	N.T.
Copper	22.1	250	N.T.	N.T.	N.T.	N.T.	N.T.
Lead	<2.5	1,000	N.T.	N.T.	N.T.	N.T.	N.T.
Mercury	<0.1	20	N.T.	N.T.	N.T.	N.T.	N.T.
Molybdenum	6.3	3,500	N.T.	N.T.	N.T.	N.T.	N.T.
Nickel	8.4	2,000	N.T.	N.T.	N.T.	N.T.	N.T.
Selenium	<2.5	100	N.T.	N.T.	N.T.	N.T.	N.T.
Silver	<2.5	500	N.T.	N.T.	N.T.	N.T.	N.T.
Thallium	<2.5	700	N.T.	N.T.	N.T.	N.T.	N.T.
Vanadium	22.0	2,400	N.T.	N.T.	N.T.	N.T.	N.T.
Zinc	38.7	2,500	N.T.	N.T.	N.T.	N.T.	N.T.
Others							
pH (standard units)	8.24	N.A.	8.03	7.60	8.54	8.33	8.15
Sodium (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.
Cyanide (mg/kg)	<0.2	N.A.	<0.2	<0.2	<0.2	<0.2	<0.2
Sulfate (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK B-1-ZH

As proposed in the Work Plan. the integrity of Clarifier B-1-ZH will be determined by visual inspection. The position of the clarifier is such that drilling is not practical even with a small, portable drilling rig. The results of the inspection will be added to this report upon completion.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZH
149
173
160


Inside Building 160
Column 29
Natural Gas
Column 78
Electrical Control Panel
Future Fume Hood
Sulfuric & Chromic Acid
27
39
Rinse Water
Rinse Water Drier
Sodium Hydroxide
3 Stage Clarifier
28
40
Alkaline Cleaner
TO BE INSPECTED
0 5 10
SCALE (feet)
LOCKHEED-CALIFORNIA COMPANY

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-2H
Plant No./Nearest Bldg.		B-1/Bldg. 160 (Inside)
Tank:	Location	1705 Victory Place
	Installation Date	1968
	Capacity, gal.	1,500
	Use/Process	Metal cleaning process clarifier (3-stage)
	Contents (past,CAS No.,date)	Dilute Chromic acid 82704221 and surfactants
	(present,CAS No.)	Dilute Chromic acid 82704221 and surfactants
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	8.2 ft
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	None
	Status	In Service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	UNK
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Portable H.S.Auger
	Borings (No.)	2
	Sample Depths	B1/10,20 ft B2/10,20 ft
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	2(Comp.)
	Parameters	Cr,pH,SO4

FIELD PROGRAM

One boring, which upon completion was converted to a suction lysimeter was drilled/installed to assess conditions surrounding Clarifier B-1-ZI.

Monitoring Installations - Boring/Suction Lysimeter B-1-ZI-B1/SL1 was drilled/installed slightly east of the approved location due to underground obstructions. Two attempts were made to drill the boring to the planned depth. The presence of concrete 2 feet below the surface prevented successful completion of the first attempt. The second attempt reached a successful depth of 40 feet. Both the actual and approved locations of the boring/suction lysimeter are indicated on the site map.

Sampling Intervals - Soil samples from the boring/suction lysimeter were to have been collected at depths of 5, 10, 15, 25 and 40 feet according to the work plan. However, samples were instead extracted from depths of 7, 15, 20, 30 and 40 feet. Based on the absence of any layers of low permeability in the upper portions of the soil horizons, and the loose, highly conductive nature of the sands that predominate the lithology, it is unlikely that a slight variance in the sampled intervals will significantly alter the chemical concentration profile of the soil.

Field Observations - The brown color and medium grain size of the sand remained consistent throughout the first 10 feet of the boring/suction lysimeter. At 10 feet, the brown sand became finer, and the gravel and cobble fraction increased. At 20 feet, the sand became slightly coarser, although some fines were still present. Pea gravel was common at depths of 12 feet and 37 feet.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - Soil samples collected from Boring B-1-ZI-B1 were composited and analyzed for volatile organics, CAM metals, cyanide, and pH.

Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZI. High concentrations of 1,1,1-trichloroethane (379 ug/kg) and trichloroethene (223 ug/kg), and moderate levels of benzene (27.8 ug/kg), chloroform (49.1 ug/kg), and 1,2-dichloroethane (16.7 ug/kg) were detected in the composite sample from B-1-ZI-B1. Concentrations reported in the CAM metals analysis were near the levels found in the background samples. The pH (6.48) was about 1.8 pH units below the calculated average for the background sample.

TANK NUMBER B-1-ZI supplement

ADDITIONAL INVESTIGATIONS

The Regional Water Quality Control Board (RWQCB), in their letter dated April 24, 1985, requested an inspection of Clarifier B-1-ZI. Clarifier B-1-ZI is of monolithic construction and is internally coated. The clarifier is not likely to be leaking. Further, the halogenated and volatile organic compounds found in a composite soil sample of Boring B-1-ZI-B1, taken October 31, 1984 are not believed to have come from this clarifier. Thus, CALAC requested that instead of inspecting the clarifier, a liquid sample should be collected for analysis and a deep boring be drilled and the soils resampled for depth-specific analysis. This request was approved by Mr. Al Novak (RWQCB); although an inspection of the clarifier may still be necessary.

The liquid from Clarifier B-1-ZI was collected for analysis May 9, 1985 and analyzed for volatile organic compounds. The pertinent laboratory analysis results are presented in Table B-1-ZI. Although the composite of the soil samples collected in October had significant concentrations of halogenated hydrocarbons, these same species were not present in the liquid sample. The liquid sample contained significant concentrations of acetone (480 mg/kg) and methylene chloride (160 ug/kg), and trace amounts of trichloroethene (5.0 ug/kg) and toluene (3.0 ug/kg) present. None of these chemicals are present in Building 151A, the reported waste water source for Clarifier B-1-ZI.

A boring, B-1-ZI-B2, was drilled next to Clarifier B-1-ZI to a depth of 60 feet on May 17, 1985. During the drilling no indication of contamination was noted. Soil samples were collected from this boring at 10, 18, 26, 34, 44, and 60 feet and analysed for volatile organic compounds and pH. Concentrations of volatile organic compounds in the soil samples collected from Borehole B-1-ZI-B2 were found to be below the limits of detection. The pH was found to be nearly neutral in each of the samples, ranging from 6.57 to 7.82. Although this range is slightly lower than the average value obtained from background samples, contamination is not suspected as soil pH is affected by the natural conditions of the soil regime and these values are not uncommon. It is concluded that B-1-ZI is not leaking.

TANK B-1-ZI (continued)

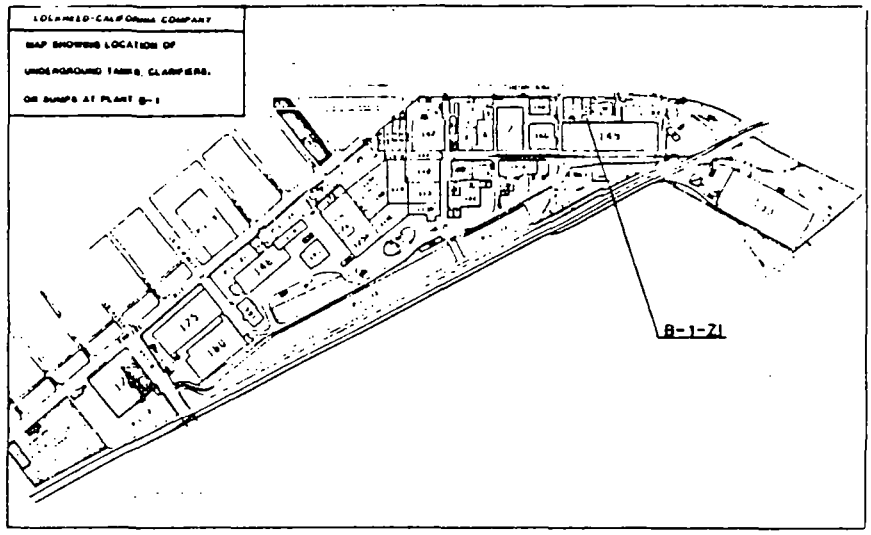
Conclusions - Based on laboratory analyses, Clarifier B-1-ZI is possibly leaking. Moderate to high concentrations of several volatile organic compounds were found in the soil composite indicating that the soil around Clarifier B-1-ZI is contaminated. However, the contamination may have resulted from sources other than leakage such as overflow and surface spills.

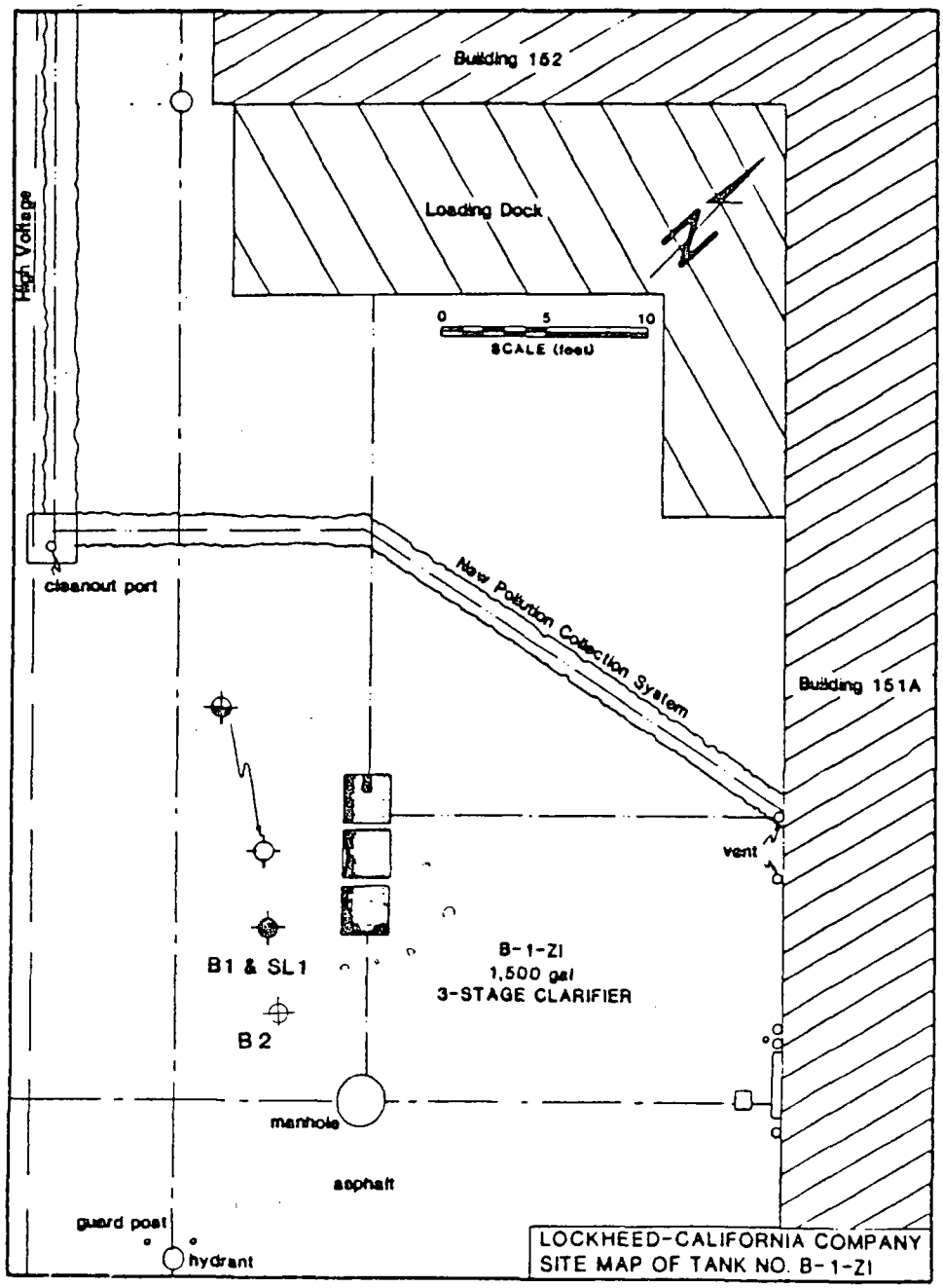
Recommendation - Additional sampling and depth specific analysis is required to determine the source of contamination in the soils around Clarifier B-1-ZI.

TANK NUMBER B-1-ZI supplement continued

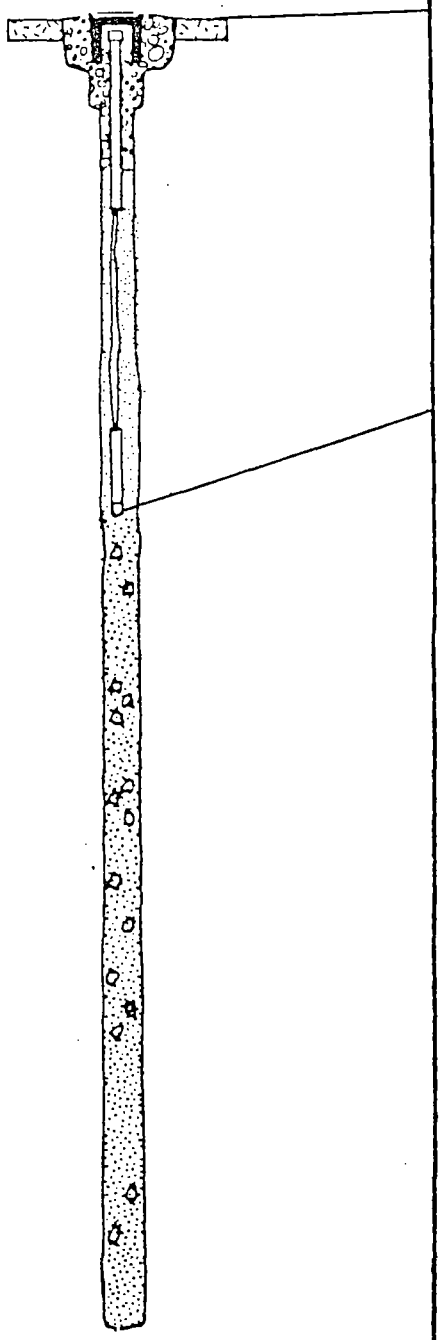
FURTHER RECOMMENDATIONS

Proceed with quarterly monitoring of the suction lysimeter.


B-1-ZI


Building 152
Loading Dock
High Voltage
0 5 10
SCALE (feet)
cleanout port
Naval Pollution Collection System
Building 151A
vent
B1 & SL1
B2
B-1-ZI
1,500 gal
3-STAGE CLARIFIER
manhole
asphalt
guard post
hydrant
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZI

Tank No.		S-1-Am
Plant No./Nearest Bldg.		S-1/Bldg. 149 SE side
Tank:	Location	1795 Victory Place
	Installation Date	UNK
	Capacity, gal.	1,000
	Use/Process	Waste oil sump SB334305
	Contents (past, CMS No., date)	Waste Oil SB334305
	(present, CMS No.)	Waste Oil SB334305
	Construction Materials	Concrete
	Geometry	Square
	Depth to Top	UNK
	Depth to Invert	4 ft deep
	Diameter	2 ft width
	Length (L)	2 ft length
	Containment	None
	Corrosive Protection (C)	None
	Status	In Service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	Slight oil staining
Drilling Program:	Rig Type/Requirements (D)	H.S. Auger Inspection
	Borings (No.)	4
	Sample Depths	
	Vapor Wells/Lysimeters (No.)	1
	Sample Depths	MW1-a,12,22,40
	Completion Interval	MW1/10-20 ft
Laboratory Program (4):		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	3 (Comp.)
	Parameters	Hydrocarbons Vol.Org.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			-Asphalt
	- 2 -			-Sand, medium grain, brown, moist
	- 4 -			
	- 6 -		12	
	- 8 -			
	- 10 -			-Sand, fine to medium grain, from 10 to 14 ft
	- 12 -			-Gravel to 1-in diameter, w/some peagravel to 17 ft
	- 14 -		12	
	- 16 -			
	- 18 -			
	- 20 -		40	
	- 22 -			
	- 24 -			
	- 26 -			
	- 28 -			
	- 30 -		39	-Sand, fine to medium grain, brown
	- 32 -			
	- 34 -			
	- 36 -			-Peagravel
	- 38 -			
	- 40 -		50+	

0837

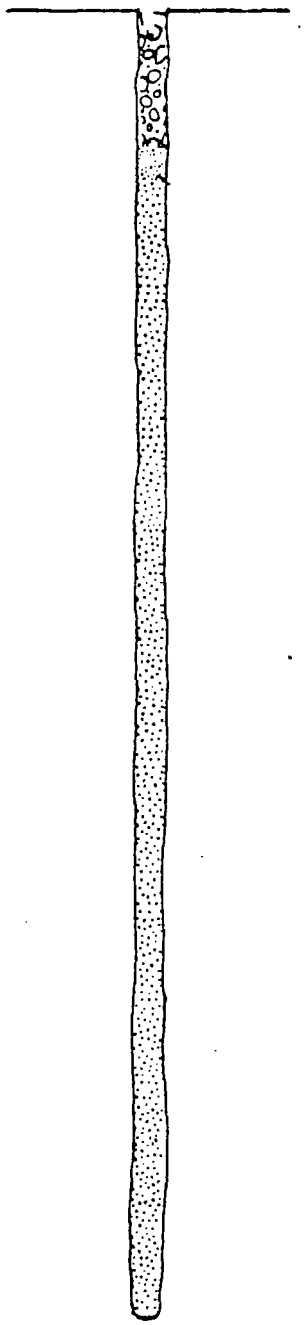
COMPLETION & BACKFILL

-Suction Lysimeter at 12 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand & native mix, 5-12 ft
-Native material, caved 12-40 ft

TANK NO. B-1-ZI

BORING NO. B-1-ZI-B1

GREGG & ASSOCIATES, INC.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 -			Sand, brown, medium, some fines and coarse, some gravel
	- 3 -			
	- 6 -			
	- 9 -			
	- 12 -		20	Ring sample at 10 Sand, variegated brown, medium to coarse, low moisture, some gravel
	- 15 -			
	- 18 -		50	Ring sample at 18 At 18, Sand, variegated brown, coarse, low moisture, some gravel
	- 21 -			
	- 24 -		50	Ring sample at 25 At 25, Sand, variegated brown, coarse to medium, low moisture, some grave
	- 27 -			
	- 30 -			
	- 33 -		35	Ring sample at 35 At 35, Sand, variegated brown, medium to fine, low moisture
	- 36 -			
	- 39 -			
	- 42 -		25	Ring sample at 43 At 43, Sand, variegated brown, fine, silty, low moisture
	- 45 -			
	- 48 -			
	- 51 -			
	- 54 -			Ring sample at 60 At 60, Silt with fine sand, red-brown, moderate moisture
	- 57 -			
	- 60 -		28	End of hole at 61

COMPLETION & BACKFILL
Builders Sand, Bentonite
0-61 ft

TANK NO. B-1-ZI

BORING NO. B-1-ZI-B2

GREGG & ASSOCIATES, INC.

TABLE B-1-ZI: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-ZI B1 COMPOSITE
Volatile Organics (ug/kg)		N.A.	
Benzene	<0.2		27.8
Ethyl Benzene	<0.1		N.D.
Chloroform	<0.1		49.1
Chloromethane	<0.2		N.D.
Chloroethane	<0.8		N.D.
1,1-Dichloroethane	<0.1		N.D.
1,2-Dichloroethane	<0.1		16.7
1,2-Dichloropropane	<0.1		N.D.
1,1,1-Trichlorethane	<0.2		379
1,1,2-Trichloroethane	<0.1		N.D.
Bromodichloromethane	<0.1		N.D.
Dibromochloromethane	<0.1		N.D.
1,1-Dichloroethene	<0.1		N.D.
trans-1,2-Dichloroethene	<0.1		N.D.
Trichloroethene	<0.3	± 2,040	223
Tetrachloroethene	<0.4		N.D.
Toluene	<0.4		N.D.
Methyl Ethyl Ketone	<0.5		N.D.
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.
CAM Metals (mg/kg)			
Antimony	<2.5	500	<2.5
Arsenic	13.4	500	15.5
Barium	91.9	10,000	81.6
Beryllium	<1.0	75	<1.0
Cadmium	<2.5	100	<0.5
Chromium (Total)	9.6	2,500	10.7
Cobalt	6.5	8,000	8.3
Copper	22.1	250	15.9
Lead	<2.5	1,000	<2.5
Mercury	<0.1	20	<0.1
Molybdenum	6.3	3,500	<1.0
Nickel	8.4	2,000	9.2
Selenium	<2.5	100	<2.5
Silver	<2.5	500	<2.5
Thallium	<2.5	700	<2.5
Vanadium	22.0	2,400	26.7
Zinc	38.7	2,500	38.5
Others			
pH (standard units)	8.24	N.A.	6.48
Sodium (mg/kg)	N.T.	N.A.	N.T.
Cyanide (mg/kg)	<0.2	N.A.	<0.2
Sulfate (mg/kg)	N.T.	N.A.	N.T.

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TABLE 6-1-21: RESULTS OF CHEMICAL ANALYSES - LOCKHEED UNDERGROUND TANK PROGRAM

PARAMETER	DETECTION LIMIT	TILE	B-1-21 B2 10 ft	B-1-21 B2 18 ft	B-1-21 B2 26 ft	B-1-21 B2 34 ft	B-1-21 B2 44 ft	B-1-21 B2 60 ft
Halogenated Volatile Organics (ug/kg)								
EPA Method 8010								
Bromodichloromethane	0.2	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Bromoform	0.09	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Bromomethane	0.06	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Carbon tetrachloride	0.08	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chlorobenzene	0.1	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloroethane	0.1	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloroform	0.05	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
2-Chloroethyl vinyl ether	0.03	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloromethane	0.02	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dichloromethane (Methylene Chloride)	0.02	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dibromochloromethane	0.07	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,2-Dichlorobenzene	0.4	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,3-Dichlorobenzene	0.4	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,4-Dichlorobenzene	0.6	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethane	0.05	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloroethane	0.07	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethene	0.07	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
trans-1,2-Dichloroethene	0.09	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloropropane	0.03	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
trans-1,3-Dichloropropene	0.11	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1,2,2-Tetrachloroethane	0.03	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tetrachloroethene	0.03	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1,1-Trichloroethane	0.03	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1,2-Trichloroethane	0.03	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Trichloroethene	0.06	2,400*	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Trichlorofluoromethane	N.D.	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Vinyl Chloride	0.03	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Aromatic Volatile Organics (ug/kg)								
EPA Method 8020								
Benzene	0.2	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chlorobenzene	0.16	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl benzene	0.1	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	0.4	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Oil & Grease (mg/kg) EPA Method 413.2	1.0	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
Metals (mg/kg)								
Chromium (total)	9.6**	2500	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
pH (standard pH units)	8.24**	N.A.	7.50	8.57	7.15	8.81	7.82	7.31
Fluoride (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.

* milligrams per kilogram (mg/kg)

** Average Values Obtained From Background Concentrations

N.A. -Not Available; N.D. -Not Detected; N.T. -Not Tested

TABLE 8-1-21 (LIQUID): RESULTS OF CHEMICAL ANALYSES - LOCKHEED UNDERGROUND TANK PROGRAM

PARAMETER	DETECTION LIMIT	TTLC	8-1-21 LIQUID
VOLATILE ORGANIC COMPOUNDS			
EPA Method 8240 (GC/MS)			
Halogenated Volatile Organics (ug/kg)			
Bromodichloromethane	1.0	N.A.	N.D.
Bromoform	1.0	N.A.	N.D.
Bromomethane	1.0	N.A.	N.D.
Carbon tetrachloride	1.0	N.A.	N.D.
Chlorobenzene	1.0	N.A.	N.D.
Chloroethane	1.0	N.A.	N.D.
Chloroform	1.0	N.A.	N.D.
2-Chloroethyl vinyl ether	1.0	N.A.	N.D.
Chloromethane	1.0	N.A.	N.D.
Dichloromethane (Methylene Chloride)	1.0	N.A.	160
Dibromochloromethane	1.0	N.A.	N.D.
1,2-Dichlorobenzene	1.0	N.A.	N.D.
1,3-Dichlorobenzene	1.0	N.A.	N.D.
1,4-Dichlorobenzene	1.0	N.A.	N.D.
1,1-Dichloroethane	1.0	N.A.	N.D.
1,2-Dichloroethane	1.0	N.A.	N.D.
1,1-Dichloroethene	1.0	N.A.	N.D.
trans-1,2-Dichloroethene	1.0	N.A.	N.D.
1,2-Dichloropropane	1.0	N.A.	N.D.
trans-1,3-Dichloropropene	1.0	N.A.	N.D.
1,1,2,2-Tetrachloroethane	1.0	N.A.	N.D.
Tetrachloroethene	1.0	N.A.	N.D.
1,1,1-Trichloroethane	1.0	N.A.	N.D.
1,1,2-Trichloroethane	1.0	N.A.	N.D.
Tricnloroethene	1.0	2,400*	5.0
Trichlorofluoromethane	1.0	N.A.	N.D.
Vinyl Chloride	1.0	N.A.	N.D.
Aromatic Volatile Organics (ug/kg)			
Benzene	1.0	N.A.	N.D.
Chlorobenzene	1.0	N.A.	N.D.
Ethyl benzene	1.0	N.A.	N.D.
Toluene	1.0	N.A.	3.0
Acetone (ug/kg)	1.0	N.A.	480
Methyl Ethyl Ketone (ug/kg)	1.0	N.A.	N.D.
Oil & Grease (mg/kg) EPA Method 413.2	1.0	N.A.	N.T.
Metals (mg/kg)			
Chromium (total)	9.6**	2500	N.T.
pH (Standard pH units)	8.24**	N.A.	N.T.
Sulfate - SO4 (mg/kg)	N.T.	N.A.	N.T.

* milligrams per kilogram (mg/kg)

** Average Values Obtained From Background Concentrations

N.A. -Not Available; N.D. -Not Detected; N.T. -Not Tested

TANK NUMBER B-1-ZJ

FIELD PROGRAM

One 30-foot boring which was converted to a suction lysimeter was drilled/installed to assess conditions surrounding Clarifier B-1-ZJ. This facility was originally scheduled for inspection, further discussions with CALAC personnel, however, indicated the difficulties imposed by a visual inspection, such as curtailment of process operations would be a serious impact on normal manufacturing procedures. Boring/Suction Lysimeter B-1-ZJ-B1/SL1 was drilled/installed to monitor the clarifier as indicated on the site map. It was, therefore, concluded that a permanent monitoring installation would be preferable to periodic visual inspections. Upon completion of the 30 foot boring, the hole was backfilled to 9 feet, where a lysimeter was installed.

Sampling Intervals - Soil samples were taken from the boring/suction lysimeter at depths of 8, 15 and 30 feet. The samples were to have been extricated using a 3 inch modified California ring sampler. However, extremely limited access necessitated the use of a smaller rig with a 4 inch solid stem auger. It was therefore, not possible to use a downhole sampler, which requires an 8 inch hollow stem auger. The solid samples were taken directly from the auger flights at the surface. The auger cut samples are subject to volatilization. Further, they may represent soil from just below the surface to depths of 8, 15 and 30 feet respectively, due to soil caving onto the auger flights. As the clarifier contains deburring agents such as plastics and ceramics, the possible volatilization of the lighter organic fractions from the auger cut samples should not significantly alter the results.

Field Observations - The brown color and medium grain size of the sand remained consistent throughout the boring/suction lysimeter. The gravel fraction increased at 9 feet and continued to 11 feet.

Indications of possible contamination were based upon observations of odor, color, moisture content and consistency of the soils. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

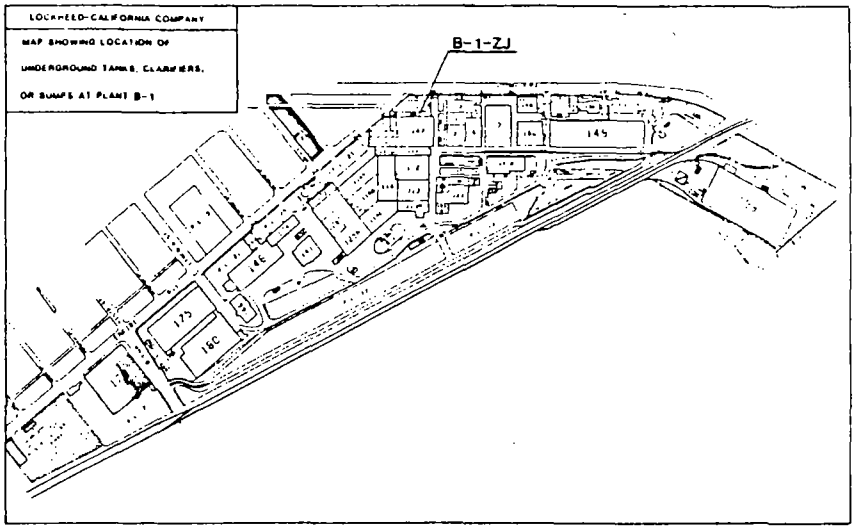
Laboratory Program - Soil samples collected from Suction Lysimeter B-1-ZJ-SL1 were composited and analyzed for volatile organics and petroleum hydrocarbons as approved in the Work Plan. A subsequent analysis of petroleum hydrocarbons on individual-depth samples was conducted.

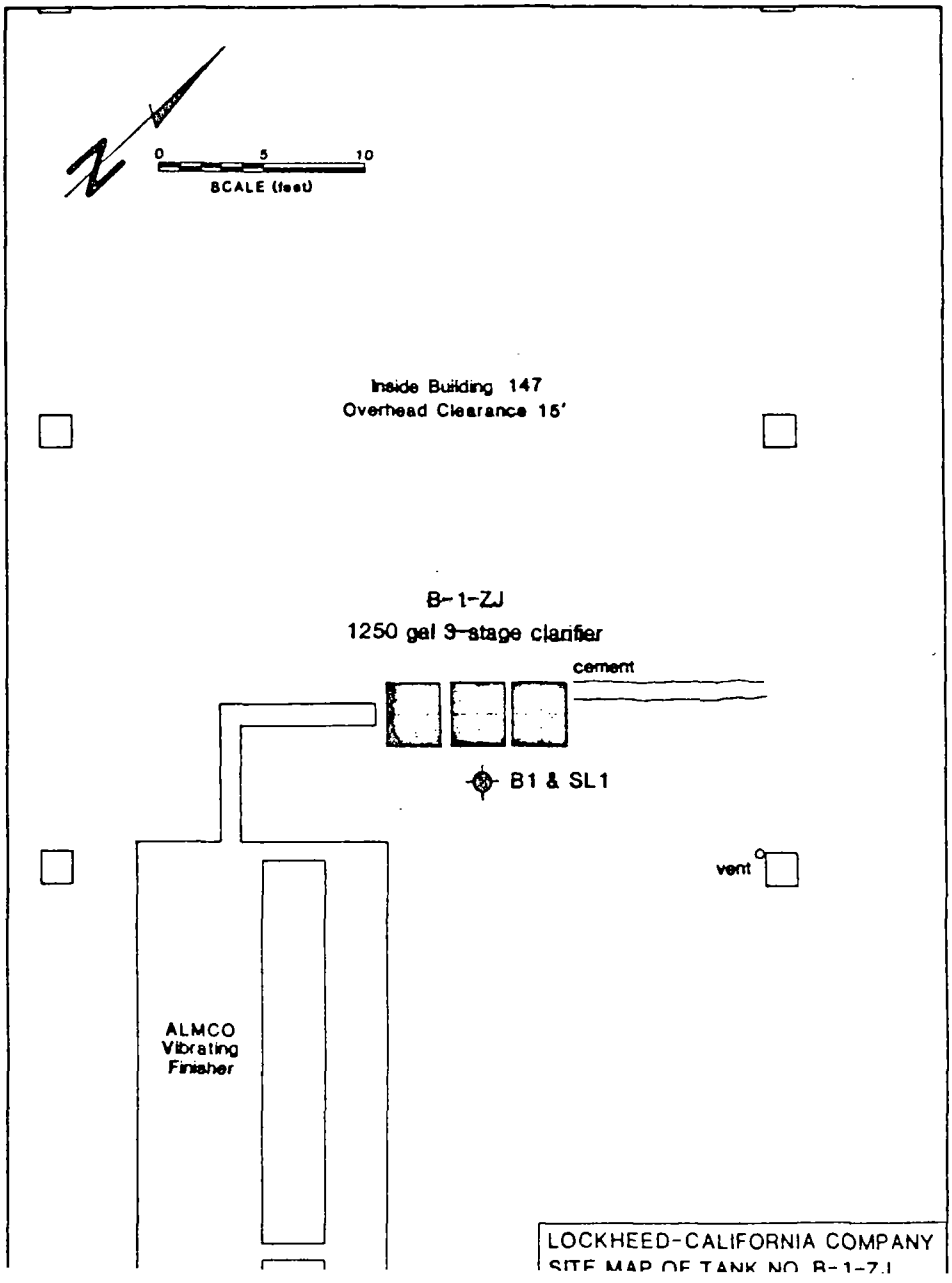
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZJ. A moderate level (20.1 mg/kg) of oil and grease was found in the composite sample. The 15-foot sample collected from the borehole for Suction Lysimeter B-1-ZJ-

SL1 was found to contain a moderate level of petroleum hydrocarbons. Volatile organic compounds were not detected in the analysis.

Conclusions - Based on field observations (no odor detected) and laboratory analysis results, it is concluded that it is unlikely that Clarifier B-1-ZJ is leaking. The moderate level of oil and grease reported for the composite sample and 15-foot individual depth sample is more likely due to contamination from the drilling operation. Clarifier B-1-ZJ is located inside a building with low overhead clearance. This necessitated the use of a portable mobile B-24 drilling rig. This rig uses solid-stem augers which are generally not as desirable for sample integrity as hollow-stem augers. It has been found that whenever solid stem augers are used, oil and grease levels of 20 to 40 ppm are not uncommon. The reason for this may be grease from the hands of drilling personnel contaminating the auger flights. Since the flights are in direct contact with the sampled soil, this is a likely source of low levels of hydrocarbons.

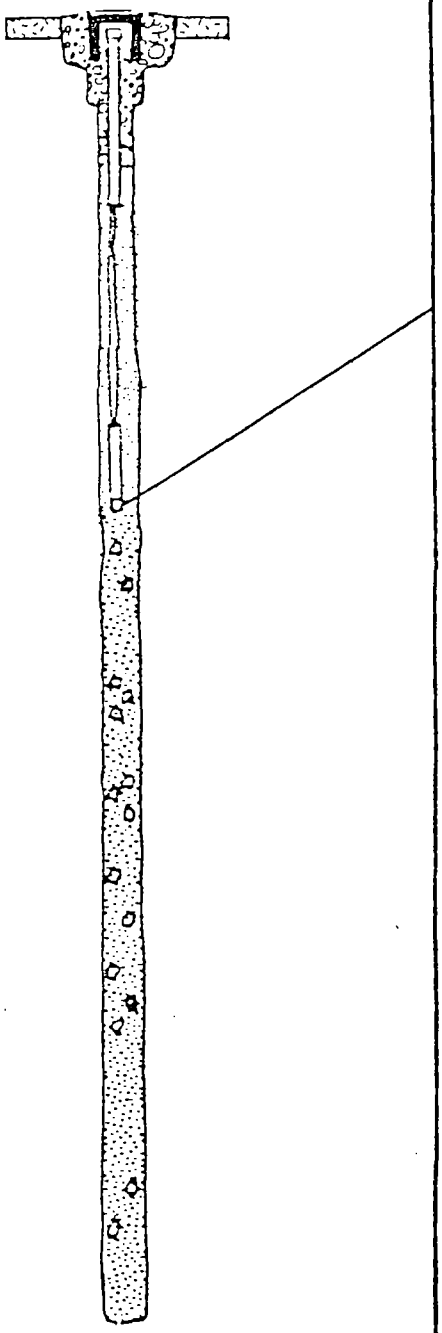
Recommendation - Proceed with quarterly monitoring.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZJ


0
5
10
SCALE (feet)
Inside Building 147
Overhead Clearance 15'
B-1-ZJ
1250 gal 3-stage clarifier
cement
B1 & SL1
vent
ALMCO
Vibrating
Finisher
LOCKHEED-CALIFORNIA COMPANY

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-ZJ
Plant No./Nearest Bldg.		B-1/Bldg. 147 (Inside)
Tank:	Location	1705 Victory Place
	Installation Date	1982
	Capacity, gal.	1,250
	Use/Process	Deburring cleaner clarifier (3-stage)
	Contents (past,CAS No.,date)	Perchloroethylene 127184
	(present,CAS No.)	Deburring cleaners
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	4.4 ft
	Diameter	3 ft width
	Length (1)	7.5 ft length
	Containment	None
	Corrosive Protection (2)	None
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Concrete
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	UNK
	Borings (No.)	S.S.Auger
	Sample Depths	B1/8,15,30 ft Jar
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	SL1/REF. TO B1
	Completion Interval	SL1/9 ft
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	1(Comp.)
	Parameters	Hydrocarbons Vol.Org.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		Jar Jar Jar	0837 -Concrete -Sand,fine to medium grain,brown,w/some gravel,occasional cobbles -Gravel

COMPLETION & BACKFILL

-Suction Lysimeter at 9 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0-4 ft
-Bentonite, 4-5 ft
-Clean sand, 5-6 ft
-Clean sand & native mix, 6-10 ft
-Native material, caved 10-30 ft

TANK NO. B-1-ZJ

BORING NO. B-1-ZJ-B1

GREGG & ASSOCIATES, INC.

TABLE B-1-ZJ: RESULTS OF CHEMICAL ANALYSES

0897

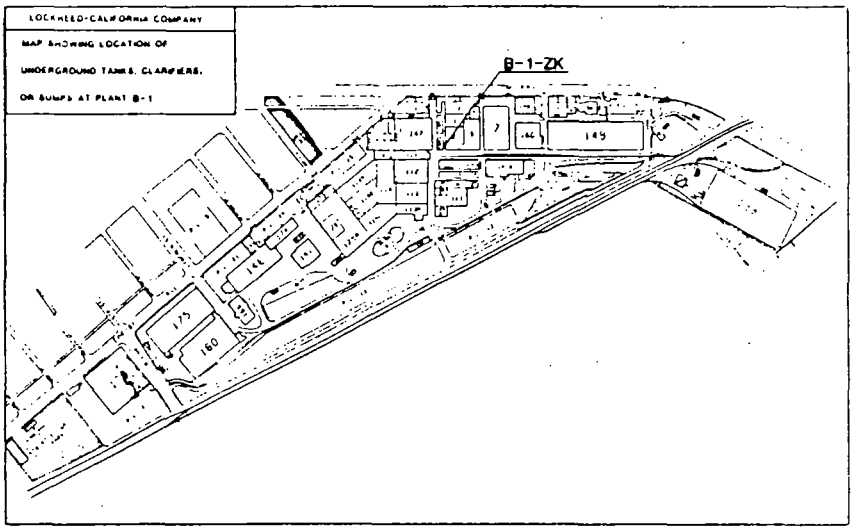
PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-ZJ SL1 COMPOSITE	B-1-ZJ SL1 (DUP.) COMPOSITE
Volatile Organics (ug/kg)		N.A.	N.D.	N.D.
Benzene	<0.2			
Ethyl Benzene	<0.1			
Chloroform	<0.1			
Chloromethane	<0.2			
Chloroethane	<0.8			
1,1-Dichloroethane	<0.1			
1,2-Dichloroethane	<0.1			
1,2-Dichloropropane	<0.1			
1,1,1-Trichlorethane	<0.2			
1,1,2-Trichloroethane	<0.1			
Bromodichloromethane	<0.1			
Dibromochloromethane	<0.1			
1,1-Dichloroethene	<0.1			
trans-1,2-Dichloroethene	<0.1			
Trichloroethene	<0.3	* 2,040		
Tetrachloroethene	<0.4			
Toluene	<0.4			
Methyl Ethyl Ketone	<0.5			
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	20.1	N.T.
CAM Metals (mg/kg)			N.T.	N.T.
Antimony	<2.5	500		
Arsenic	13.4	500		
Barium	91.9	10,000		
Beryllium	<1.0	75		
Cadmium	<2.5	100		
Chromium (Total)	9.6	2,500		
Cobalt	6.5	8,000		
Copper	22.1	250		
Lead	<2.5	1,000		
Mercury	<0.1	20		
Molybdenum	6.3	3,500		
Nickel	8.4	2,000		
Selenium	<2.5	100		
Silver	<2.5	500		
Thallium	<2.5	700		
Vanadium	22.0	2,400		
Zinc	38.7	2,500		
Others			N.T.	N.T.
pH (standard units)	8.24	N.A.		
Sodium (mg/kg)	N.T.	N.A.		
Cyanide (mg/kg)	<0.2	N.A.		
Sulfate (mg/kg)	N.T.	N.A.		

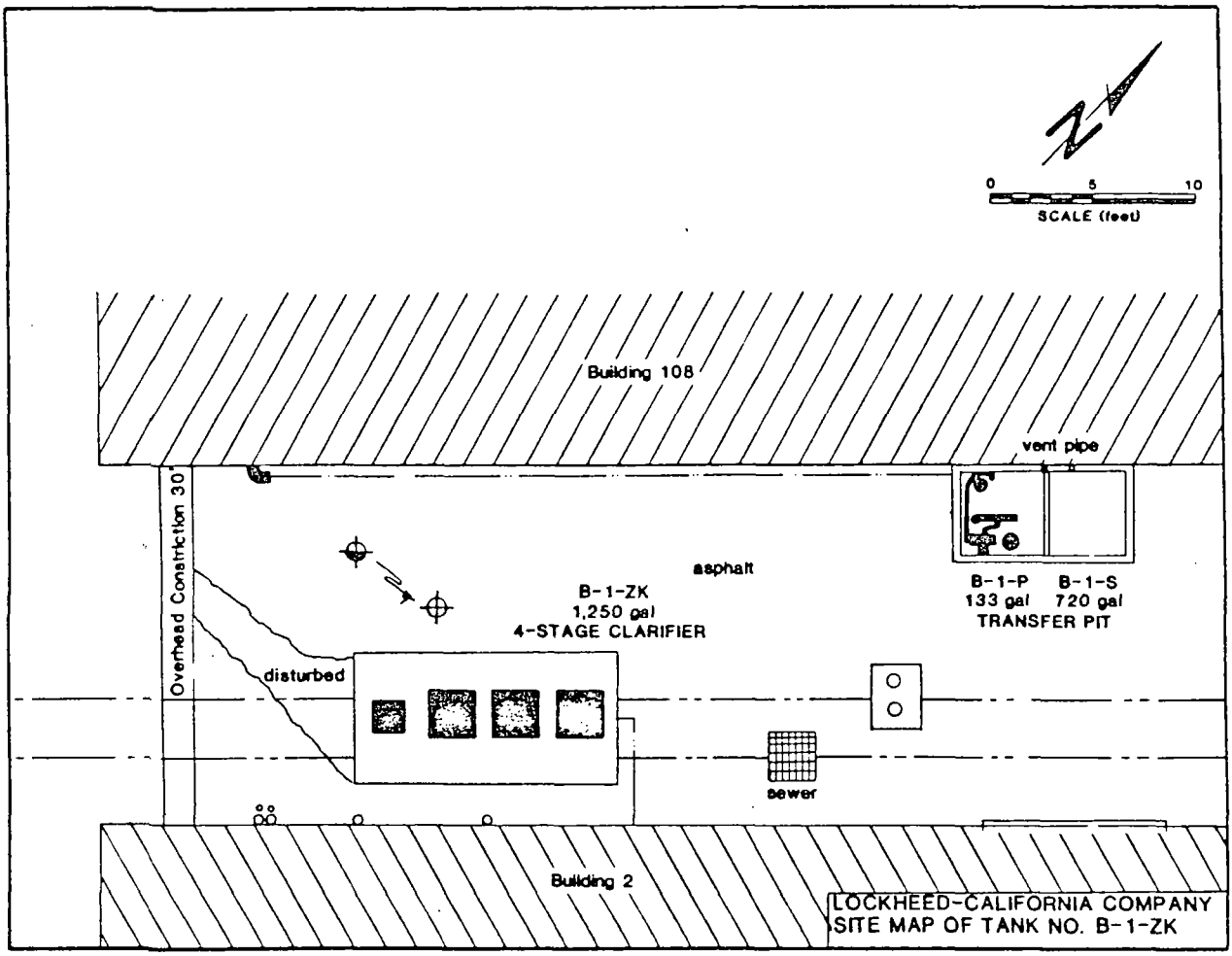
N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION
* - mg/kg

TANK B-1-ZK

The integrity of Tank B-1-ZK will be determined by visual inspection as approved in the field by Mr. Al Novak, RWQCB. The facility consists of a four-stage clarifier for containing detergents from a vibrating finish process. The clarifier is placed in concrete reportedly in excess of 3 to 5 feet. This was confirmed by drilling small diameter boreholes (3/8-inch) at 10 locations near the clarifier. Although all 10 boreholes were drilled to a depth of 18 inches, none completely penetrated the concrete. Drilling through concrete in excess of 18 inches in an area congested with underground pipes is considered unsafe and impractical. However, while this thickness of concrete prevents drilling, it also serves as a barrier against surficial leaks. The only avenue for leakage would be a crack extending the depth of the concrete. Such a crack would have some surface expression and would, therefore, de detected in a visual inspection. The results of this inspection will be added to this report upon completion.

0837


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZK


N
0
5
10
SCALE (feet)
Building 108
vent pipe
Overhead Constriction 30'
asphalt
B-1-ZK
1,250 gal
4-STAGE CLARIFIER
B-1-P
133 gal
B-1-S
720 gal
TRANSFER PIT
disturbed
sewer
Building 2
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZK

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-2K
Plant No./Nearest Bldg.		B-1/Bldg. 2 (N Side)
Tank:	Location	1705 Victory Place
	Installation Date	1981
	Capacity, gal.	1,250
	Use/Process	Deburring process rinse tanks clarifier (4-stage)
	Contents (past,CAS No.,date)	Detergent-Vibrafinish VF77
	(present,CAS No.)	Detergent-Vibrafinish VF77
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	2.2 ft width
	Length (1)	13 ft length
	Containment	None
	Corrosive Protection (2)	None
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface [illegible]	UNK
Drilling Program:	Rig Type/Requirements (3)	Inspection
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

TANK B-1-ZL

It was reported that Tank B-1-ZL was removed sometime around 1981. No further action is planned.

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-ZL
Plant No./Nearest Bldg.		B-1/Bldg. 179 (N Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	UNK
	Use/Process	Boiler Blowdown
	Contents (past,CAS No.,date)	Boiler blowdown
	(present,CAS No.)	None
	Construction Materials	UNK
	Geometry	UNK
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	UNK
	Corrosive Protection (2)	UNK
	Status	Reportedly removed
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Overlying concrete patch
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Inspection
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeter (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	

FIELD PROGRAM

One boring, which was converted to a suction lysimeter, was drilled/installed to assess conditions surrounding Tank B-1-ZM.

Monitoring Installations - Boring/Suction Lysimeter B-1-ZM-B1/SL1 was drilled/installed tank south of the approved location due to rig access problems. Two attempts were made to drill the boring to the planned depth. Underground obstructions prevented successful completion of the first attempt. The second attempt reached a successful depth of completion of 40 feet. Both the actual and approved locations of the boring/suction lysimeter are indicated on the site map.

Sampling Intervals - Soil samples from the boring/suction lysimeter were to have been collected at depths of 5, 12, 17, 25 and 40 feet according to the Work Plan. However, in order to expedite the sampling procedure, the samples were collected from depths of 5, 10, 15, 25 and 40 feet.

Field Observations - The dark brown color and medium to coarse grain size of the sand remained consistent throughout the entire borehole. There were small scattered chunks of green paint occasionally present in the auger cuttings. The occurence of cobbles remained frequent but scattered throughout the excavation.

Indications of possible contamination were based upon observations of odor, color, moisture content and soil consistency. There were no indications of contamination other than the infrequent small chunks of paint which are thought to be construction debris.

LABORATORY PROGRAM AND ANALYSIS

Laboratory Program - A liquid sample of the contents of Clarifier B-1-ZM was collected and treated with nitric acid to maintain metals in a soluble form for subsequent CAM metals analysis. A second liquid sample was collected and analyzed for volatile organic compounds and pH. Individual soil samples were composited and analyzed for volatile organics, CAM metals, cyanide, and pH. These analyses are approved in the work plan.

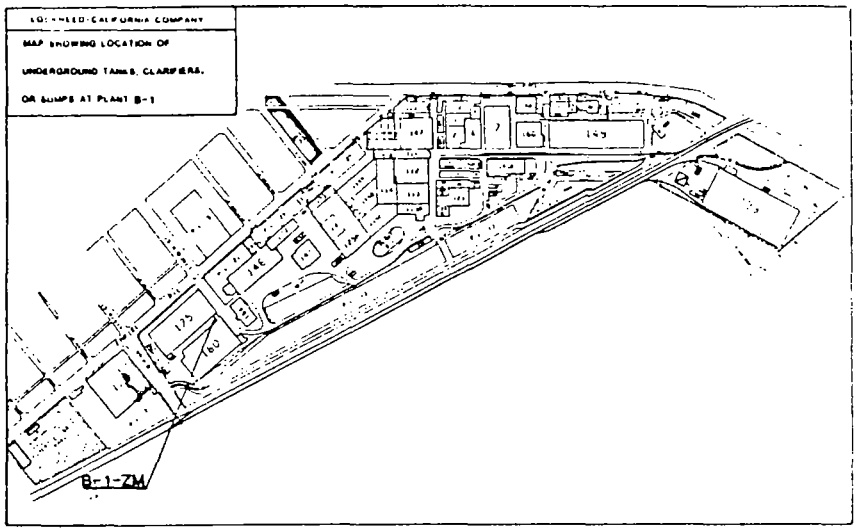
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZM. The liquid sample was found to contain 192 mg/kg of barium, 161 mg/kg of total chromium, 69 mg/kg of copper, 11.1 mg/kg of lead, and 53 mg/kg of zinc. The liquid sample was reported to contain 1,1,1-trichloroethane (78.9 ug/kg), tetrachloroethene (33.9 ug/kg), and Freon 113 (1540 ug/kg). A low level of tetrachloroethene (4.2 ug/kg) was found in the Boring B-1-ZM-B1 composite soil sample. The remaining

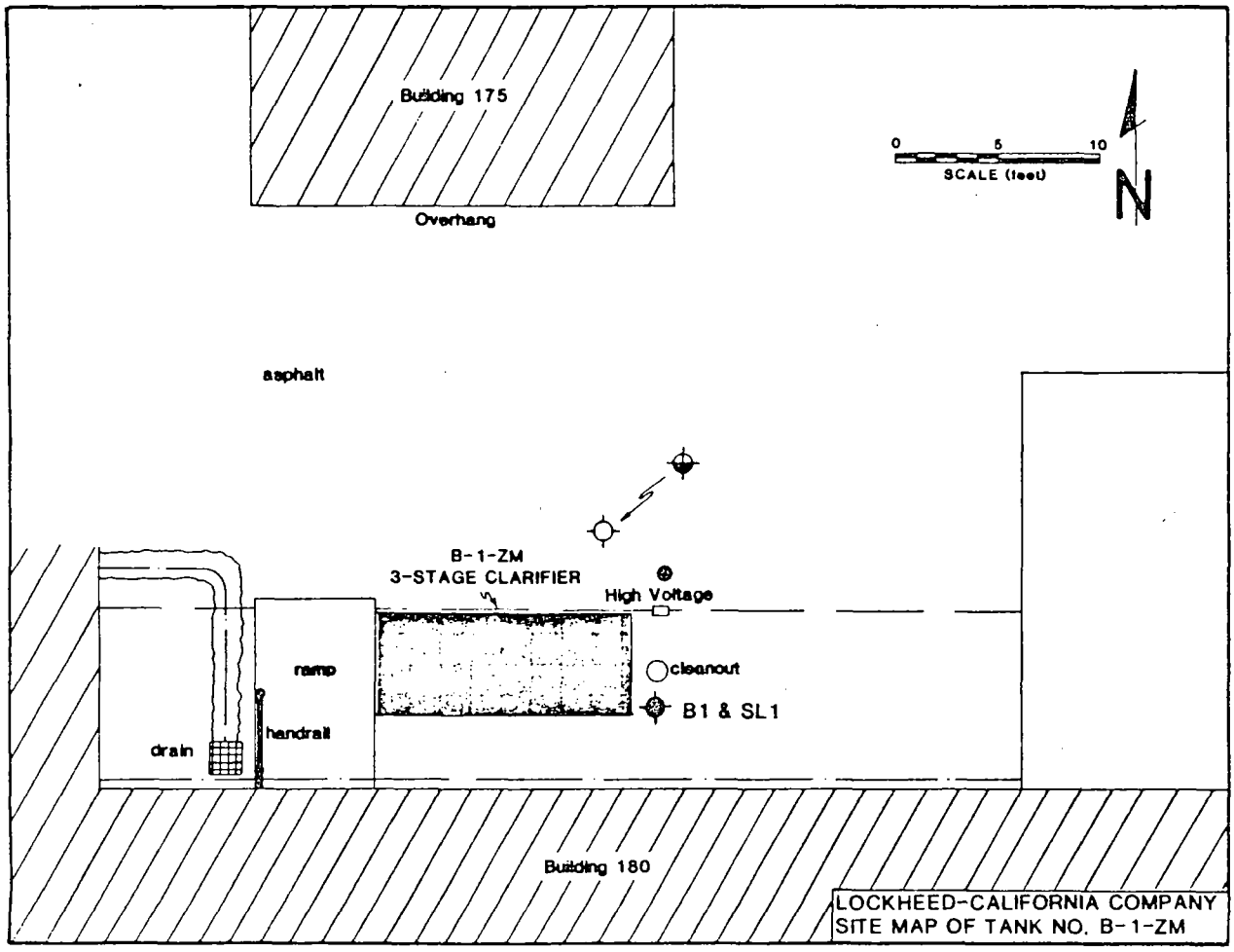
TANK B-1-ZM (continued)

volatile organic compounds, CAM metals, cyanide, and pH were found to be below the limits of detection or near the levels reported for the background samples.

Conclusion - Based on field observations and laboratory analysis results, it is concluded that it is unlikely that Clarifier B-1-ZM is leaking. The low concentration of tetrachloroethene reported for the soil sample is more likely due to surface spills or clarifier overflow.

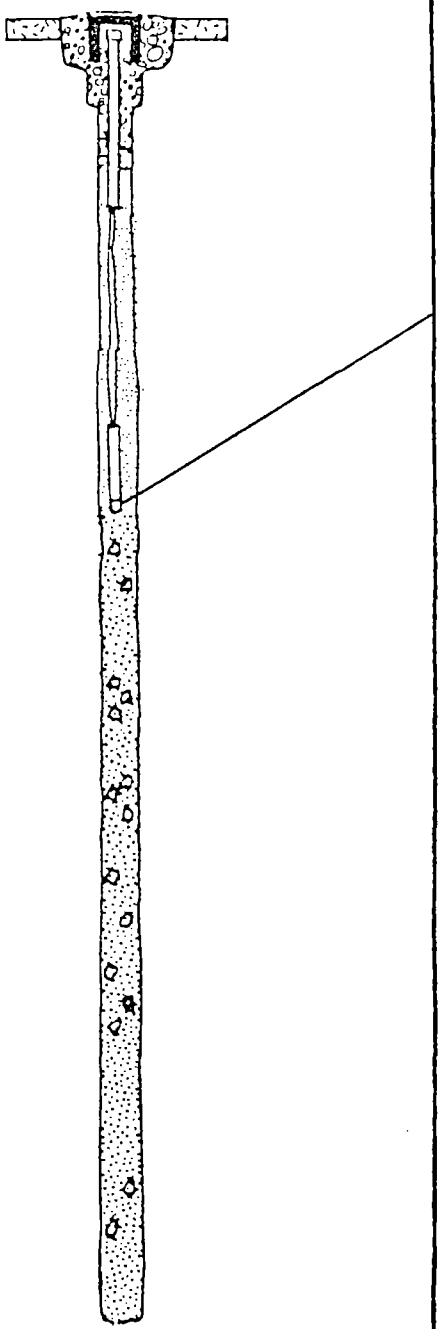
Recommendations - Proceed with quarterly monitoring of the suction lysimeter.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZM


Building 175
Overhang
0
5
10
SCALE (feet)
N
asphalt
B-1-ZM
3-STAGE CLARIFIER
High Voltage
ramp
cleanout
B1 & SL1
handrail
drain
Building 180
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZM

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-2M
Plant No./Nearest Bldg.		B-1/Bldg. 180 (N Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	UNK
	Use/Process	Chem lab sink drain clarifier (3-stage)
	Contents (past,CAS No.,date)	UNK
	(present,CAS No.)	UNK
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	5 ft width
	Length (1)	12.7 ft length
	Containment	None
	Corrosive Protection (2)	Poss. fiberglass lined
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S.Auger
	Borings (No.)	1
	Sample Depths	B1/5,10,15,25,40 ft
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	SL1/REF. TO B1
	Completion Interval	SL1/9 ft
Laboratory Program (4)		
	No. of Tank Content Samples	3
	Parameters	CAM,pH Vol.Org.
	No. of Tank Soil Samples	1(Comp.)
	Parameters	CAM,Cn,pH Vol.Org.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		53 55 81 69 83	-Asphalt -Sand,medium to coarse grain,dark brown,w/some gravel,large cobbles, I0 to 15-in diameter -Gravel -Lime green paint fragments

COMPLETION & BACKFILL

-Suction Lysimeter at 9 ft
-Blank 2-in I.D. PVC pipe, 0-5 ft
-Concrete, 0.5-4 ft
-Bentonite, 4-5 ft
-Clean sand & native mix, 5-10 ft
-Native material, caved 10-40 ft

TANK NO. B-1-ZM

BORING NO. B-1-ZM-B1

GREGG & ASSOCIATES, INC.

TABLE B-1-ZM: RESULTS OF CHEMICAL ANALYSES

PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-ZM LIQUID TREATED	B-1-ZM LIQUID UNTREATED	B-1-ZM B1 COMPOSITE
Volatile Organics (ug/kg)		N.A.	N.T.		
Benzene	<0.2			N.D.	N.D.
Ethyl Benzene	<0.1			N.D.	N.D.
Chloroform	<0.1			N.D.	N.D.
Chloromethane	<0.2			N.D.	N.D.
Chloroethane	<0.8			N.D.	N.D.
1,1-Dichloroethane	<0.1			N.D.	N.D.
1,2-Dichloroethane	<0.1			N.D.	N.D.
1,2-Dichloropropane	<0.1			N.D.	N.D.
1,1,1-Trichlorethane	<0.2			78.9	N.D.
1,1,2-Trichloroethane	<0.1			N.D.	N.D.
1,1-Dichloroethene	<0.1			N.D.	N.D.
trans-1,2-Dichloroethene	<0.1			N.D.	N.D.
Trichloroethene	<0.3	± 2,040		N.D.	N.D.
Tetrachloroethene	<0.4			33.9	4.2
Toluene	<0.4			N.D.	N.D.
Methyl Ethyl Ketone	<0.5			N.D.	N.D.
Carbon Tetrachloride	<0.1			0.8	N.D.
Freon 113	N.T.			1540	N.T.
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	N.T.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.
CAM Metals (mg/kg)				N.T.	
Antimony	<2.5	500	4.20		<2.5
Arsenic	13.4	500	0.62		5.18
Barium	91.9	10,000	192		42.0
Beryllium	<1.0	75	<0.1		<1.0
Cadmium	<2.5	100	7.69		<0.5
Chromium (Total)	9.6	2,500	161		6.3
Cobalt	6.5	8,000	0.42		5.1
Copper	22.1	250	69		8.9
Lead	<2.5	1,000	11.1		<2.5
Mercury	<0.1	20	0.09		0.2
Molybdenum	6.3	3,500	3.4		11.1
Nickel	8.4	2,000	2.2		4.9
Selenium	<2.5	100	4.0		<2.5
Silver	<2.5	500	1.3		<2.5
Thallium	<2.5	700	<0.05		<2.5
Vanadium	22.0	2,400	1.4		15.8
Zinc	38.7	2,500	53		13.9
Others			N.T.		
pH (standard units)	8.24	N.A.		7.07	8.41
Sodium (mg/kg)	N.T.	N.A.		N.T.	N.T.
Cyanide (mg/kg)	<0.2	N.A.		N.T.	<0.2
Sulfate (mg/kg)	N.T.	N.A.		N.T.	N.T.

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION

TANK NUMBER B-1-ZN

FIELD PROGRAM

One boring, which was converted to a suction lysimeter, was drilled/installed to assess conditions surrounding Sump B-1-ZN. B-1-ZN is a pumpout port in a secondary containment beam for an above ground spent acid tank.

Monitoring Installations - Boring/Suction Lysimeter B-1-ZN-B1/SL1 was drilled/installed to monitor the sump as indicated in the approved work plan. Upon completion, the boring was backfilled to a depth of 6 feet at which level a lysimeter was installed. The location of the boring/suction lysimeter is indicated on the site map.

Sampling Intervals - Soil samples from the boring/suction lysimeter were to have been collected at depths of 5, 10, 20, 30 and 40 feet according to the work plan. However, in order to sample a depth closer to the bottom of the sump, a 15 foot sample was collected instead of a 20 foot sample. All other samples were extracted from the approved depths.

Field Observations - The dark brown color and medium to fine grain size of the sand remained consistent throughout the first 16 feet of the boring/suction lysimeter. At 16 feet the sand became coarser and the gravel and cobble fraction increased which corresponds to the color becoming gray at the same depth.

Indications of possible contamination were based upon observations of odor, color, moisture content, and soil consistency. There were no indications of contamination.

LABORATORY PROGRAM AND ANALYSIS

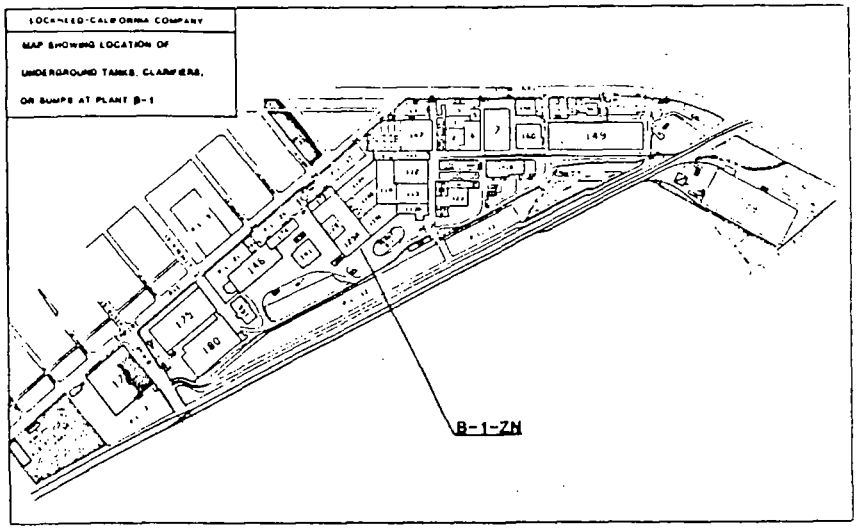
Laboratory Program _ A liquid sample was collected from Sump B-1-ZN and treated with nitric acid to maintain metals in soluble form for subsequent CAM metals analysis. A second liquid sample was collected and analyzed for volatile organics, CAM metals, cyanide, and pH. Soil samples were collected from Boring B-1-ZN-B1 and composited for subsequent analysis of volatile organic compounds, CAM Metals, cyanide, and pH. These analyses are approved in the work plan.

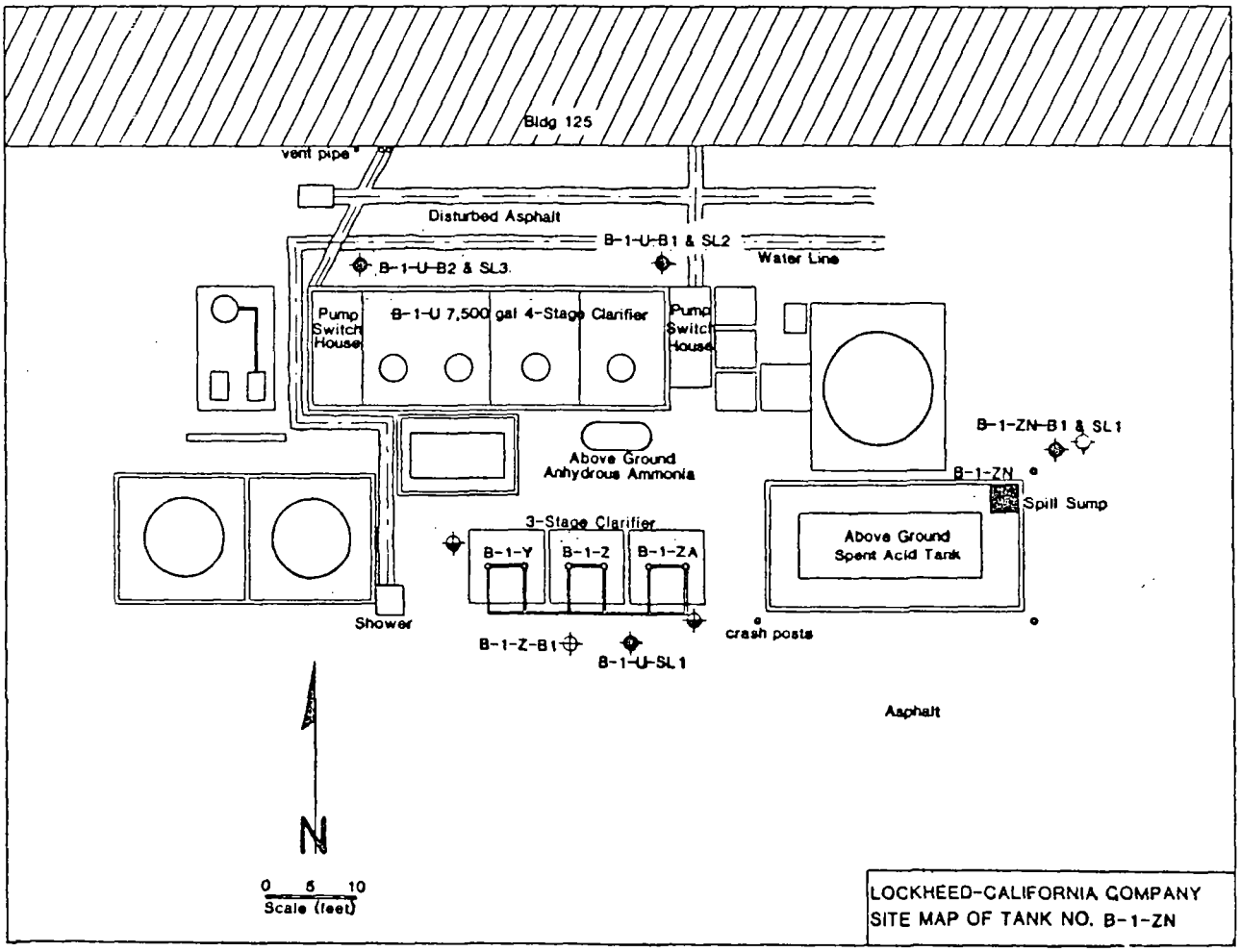
Laboratory Analysis - The pertinent laboratory analysis results are summarized in Table B-1-ZN. The liquid sample was found to contain concentrations of CAM metals that are below the limits of detection or near the levels reported for the background samples. A concentration of 4490 ug/kg tetrachloroethene and a pH of 1.12 was reported for the liquid sample. A moderate level of chloroform (4.6 ug/kg) was detected in the composite soil sample

from Boring B-1-ZN-B1. The remaining volatile organic compounds, CAM metals, cyanide, and pH levels were below the limits of detection or near the levels found in the background sample.

Conclusions - Based on field observations and laboratory analysis results, it is concluded that it is unlikely that Clarifier B-1-ZN is leaking. The low concentration of chloroform (4.6 ug/kg) reported for the soil sample is more likely due to surface spills or sump overflow as the high level of tetrachloroethene and low pH found in the liquid sample of the clarifier contents would be reflected in the soil sample analyses if the clarifier were leaking.

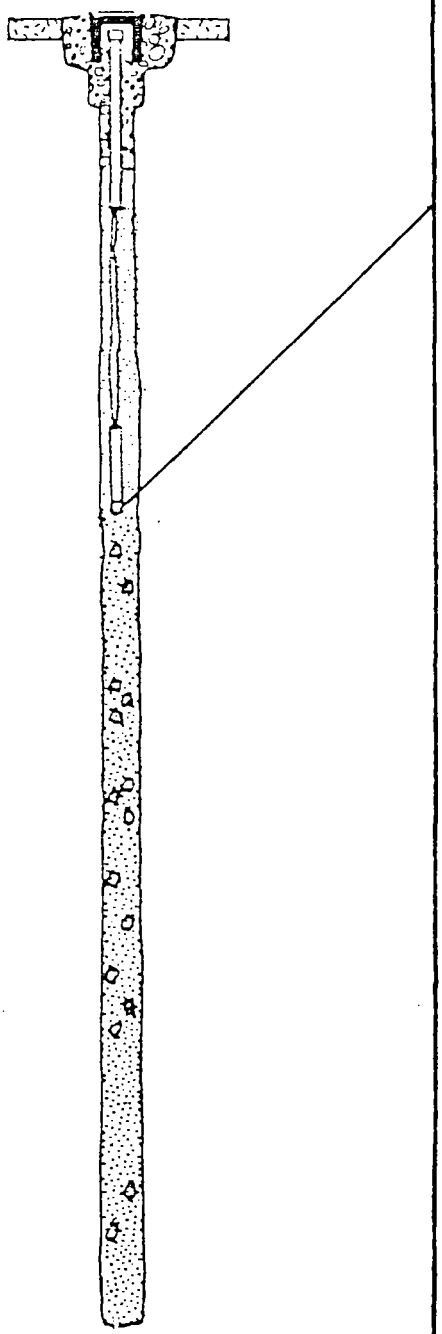
Recommendations - Proceed with quarterly monitoring of the suction lysimeter.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZN


Bldg 125
vent pipe
Disturbed Asphalt
B-1-U-B1 & SL2
Water Line
B-1-U-B2 & SL3
Pump Switch House
B-1-U 7,500 gal 4-Stage Clarifier
Pump Switch House
B-1-ZN-B1 & SL1
B-1-ZN
Spill Sump
Above Ground Anhydrous Ammonia
3-Stage Clarifier
B-1-Y
B-1-Z
B-1-ZA
Above Ground Spent Acid Tank
Shower
crash posts
B-1-Z-B1
B-1-U-SL1
Asphalt
N
0 5 10
Scale (feet)
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZN

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-ZN
Plant No./Nearest Bldg.		B-1/Bldg. 125A (S Side)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	UNK
	Use/Process	Spill retention sump
	Contents (past,CAS No.,date)	UNK
	(present,CAS No.)	UNK
	Construction Materials	Concrete
	Geometry	Square
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	3.3 ft width
	Length (1)	3.3 ft length
	Containment	None
	Corrosive Protection (2)	Epoxy lined
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Asphalt
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	H.S.Auger
	Borings (No.)	1
	Sample Depths	B1/5,10,15,30,40 ft
	Vapor Wells/Lysimeter (No.)	1
	Sample Depths	SL1/REF. TO B1
	Completion Interval	SL1/6 ft
Laboratory Program (4)		
	No. of Tank Content Samples	3
	Parameters	CAM,pH Vol.Org.
	No. of Tank Soil Samples	1(Comp.)
	Parameters	CAM,Ca,pH Vol.Org.

CONSTRUCTION DETAILS	DEPTH	LOG	BLOW CNTS	LITHOLOGIC DESCRIPTION
	- 0 - - 2 - - 4 - - 6 - - 8 - - 10 - - 12 - - 14 - - 16 - - 18 - - 20 - - 22 - - 24 - - 26 - - 28 - - 30 - - 32 - - 34 - - 36 - - 38 - - 40 -		10 13 39 26 50+	-Asphalt -Sand,silty,fine to medium grain,dark brown w/some cobbles -Sand,fine to coarse grain,gray-brown,w/some gravel -Lime green paint fragments

COMPLETION & BACKFILL

-Suction Lysimeter at 6 ft
-Blank 2-in I.D. PVC pipe, 0-3 ft
-Concrete, 0-2 ft
-Bentonite, 2-3 ft
-Clean sand, 3-4 ft
-Clean sand & native mix, 4-15 ft
-Native material, caved 15-40 ft

TANK NO. B-1-ZN

BORING NO. B-1-ZN-B1

GREGG & ASSOCIATES, INC.

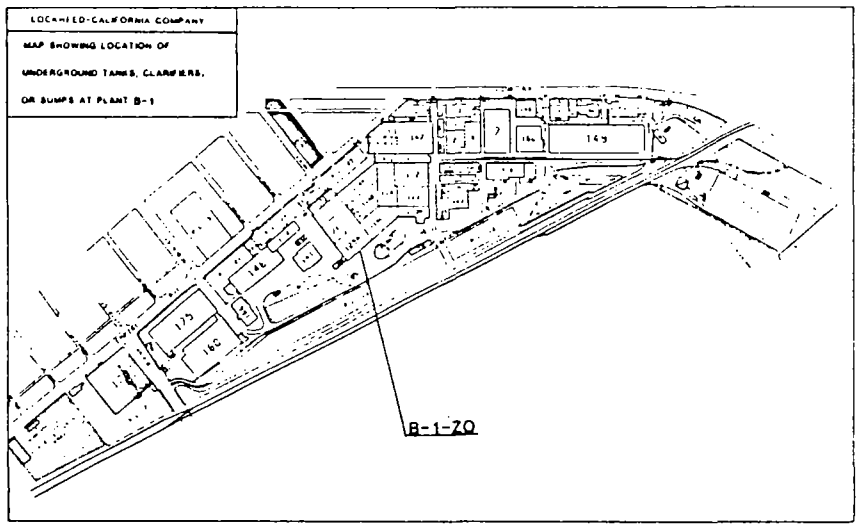
TABLE B-1-ZN: RESULTS OF CHEMICAL ANALYSES

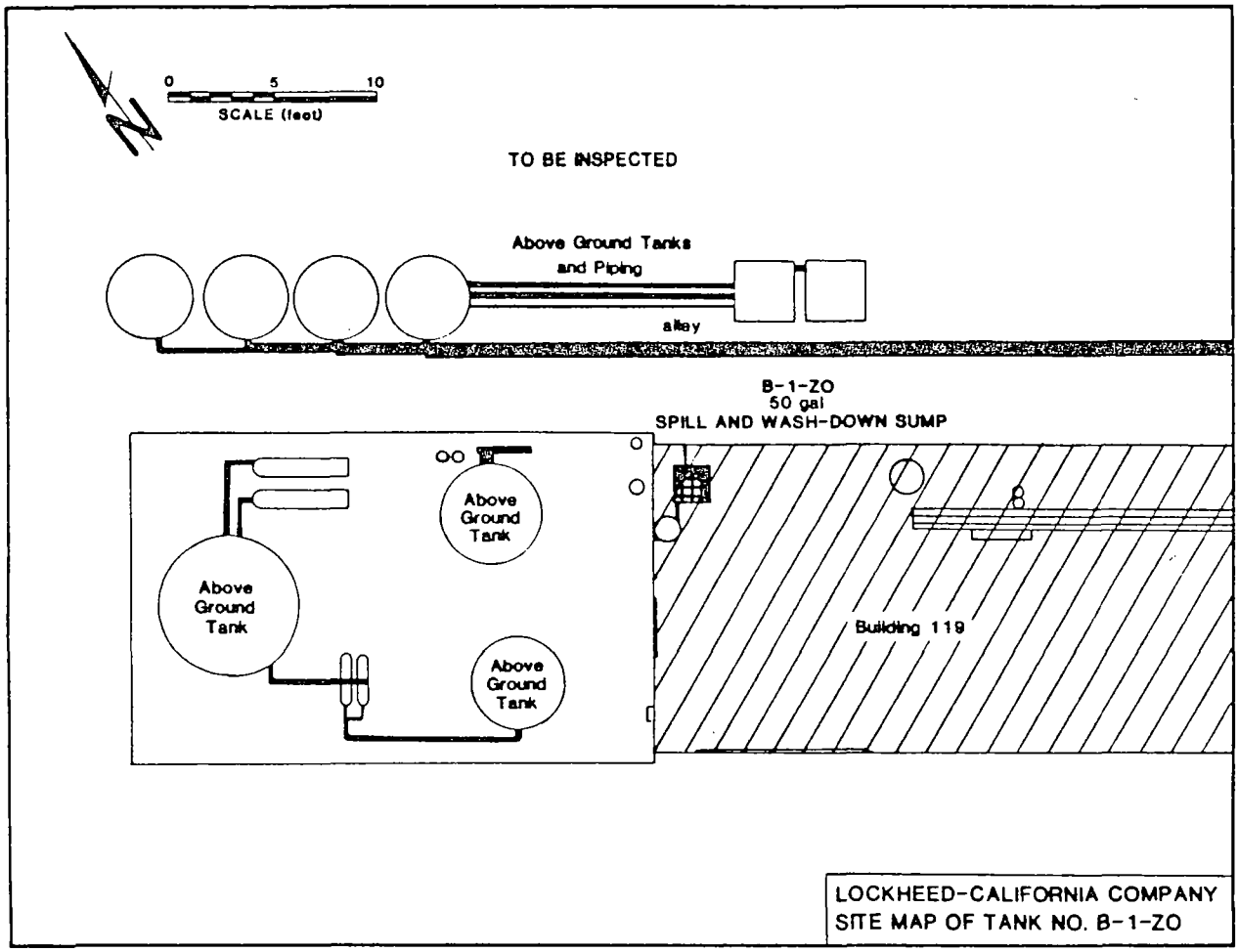
PARAMETER	BACK-GROUND SAMPLE	TTLC	B-1-ZN LIQUID TREATED	B-1-ZN LIQUID UNTREATED	B-1-ZN B1 COMPOSITE
Volatile Organics (ug/kg)		N.A.	N.T.		
Benzene	<0.2			N.D.	N.D.
Ethyl Benzene	<0.1			N.D.	N.D.
Chloroform	<0.1			N.D.	4.6
Chloromethane	<0.2			N.D.	N.D.
Chloroethane	<0.8			N.D.	N.D.
1,1-Dichloroethane	<0.1			N.D.	N.D.
1,2-Dichloroethane	<0.1			N.D.	N.D.
1,2-Dichloropropane	<0.1			N.D.	N.D.
1,1,1-Trichlorethane	<0.2			N.D.	N.D.
1,1,2-Trichloroethane	<0.1			N.D.	N.D.
Bromodichloromethane	<0.1			N.D.	N.D.
Dibromochloromethane	<0.1			N.D.	N.D.
1,1-Dichloroethene	<0.1			N.D.	N.D.
trans-1,2-Dichloroethene	<0.1			N.D.	N.D.
Trichloroethene	<0.3	* 2,040		N.D.	N.D.
Tetrachloroethene	<0.4			4490	N.D.
Toluene	<0.4			N.D.	N.D.
Methyl Ethyl Ketone	<0.5			N.D.	N.D.
Petroleum Hydrocarbon (mg/kg)	<2.0	N.A.	N.T.	N.T.	N.T.
Oil & Grease (mg/kg)	N.T.	N.A.	N.T.	N.T.	N.T.
CAM Metals (mg/kg)				N.T.	
Antimony	<2.5	500	<0.25		<2.5
Arsenic	13.4	500	<0.25		12.8
Barium	91.9	10,000	0.6		75.8
Beryllium	<1.0	75	<0.1		<1.0
Cadmium	<2.5	100	1.51		<0.5
Chromium (Total)	9.6	2,500	9.5		11.9
Cobalt	6.5	8,000	1.7		7.9
Copper	22.1	250	4.6		14.3
Lead	<2.5	1,000	2.3		<2.5
Mercury	<0.1	20	0.008		<0.1
Molybdenum	6.3	3,500	4.2		<1.0
Nickel	8.4	2,000	0.3		8.8
Selenium	<2.5	100	<0.25		<2.5
Silver	<2.5	500	0.6		<2.5
Thallium	<2.5	700	<0.05		<2.5
Vanadium	22.0	2,400	2.8		27.1
Zinc	38.7	2,500	1.8		33.9
Others			N.T.		
pH (standard units)	8.24	N.A.		1.12	7.11
Sodium (mg/kg)	N.T.	N.A.		N.T.	N.T.
Cyanide (mg/kg)	<0.2	N.A.		N.T.	<0.2
Sulfate (mg/kg)	N.T.	N.A.		N.T.	N.T.

N.A. - NOT AVAILABLE
N.D. - NOT DETECTED
N.T. - NOT TESTED
TTLC - TOTAL THRESHOLD LIMIT CONCENTRATION
* mg/kg

TANK B-1-ZO

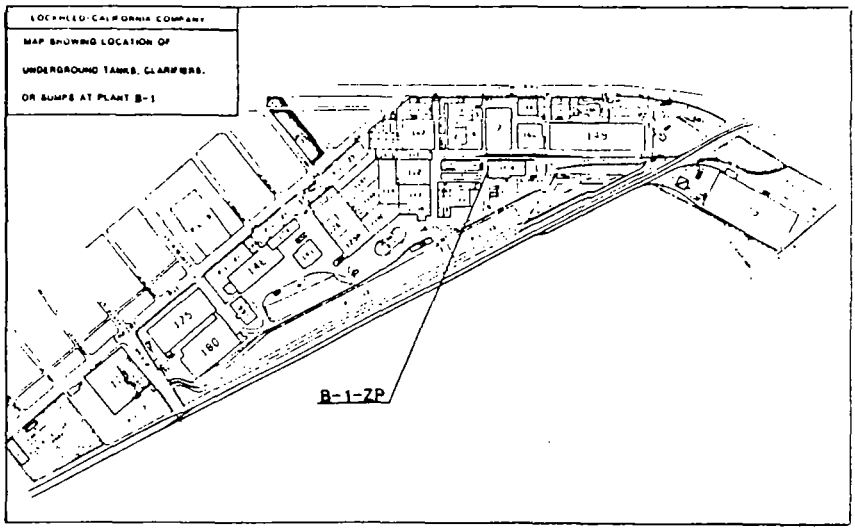
The integrity of Sump B-1-ZO was determined by visual inspection, as approved in the Work Plan. The facility consists of a small sump for spill protection of reverse osmosis process. As the sump was installed in 1984 and coated with a protective sealer, no degradation was apparent. The sump contains liquid only sporadically and is filled primarily with runoff from the adjacent wash drain unit. No further action is recommmended.

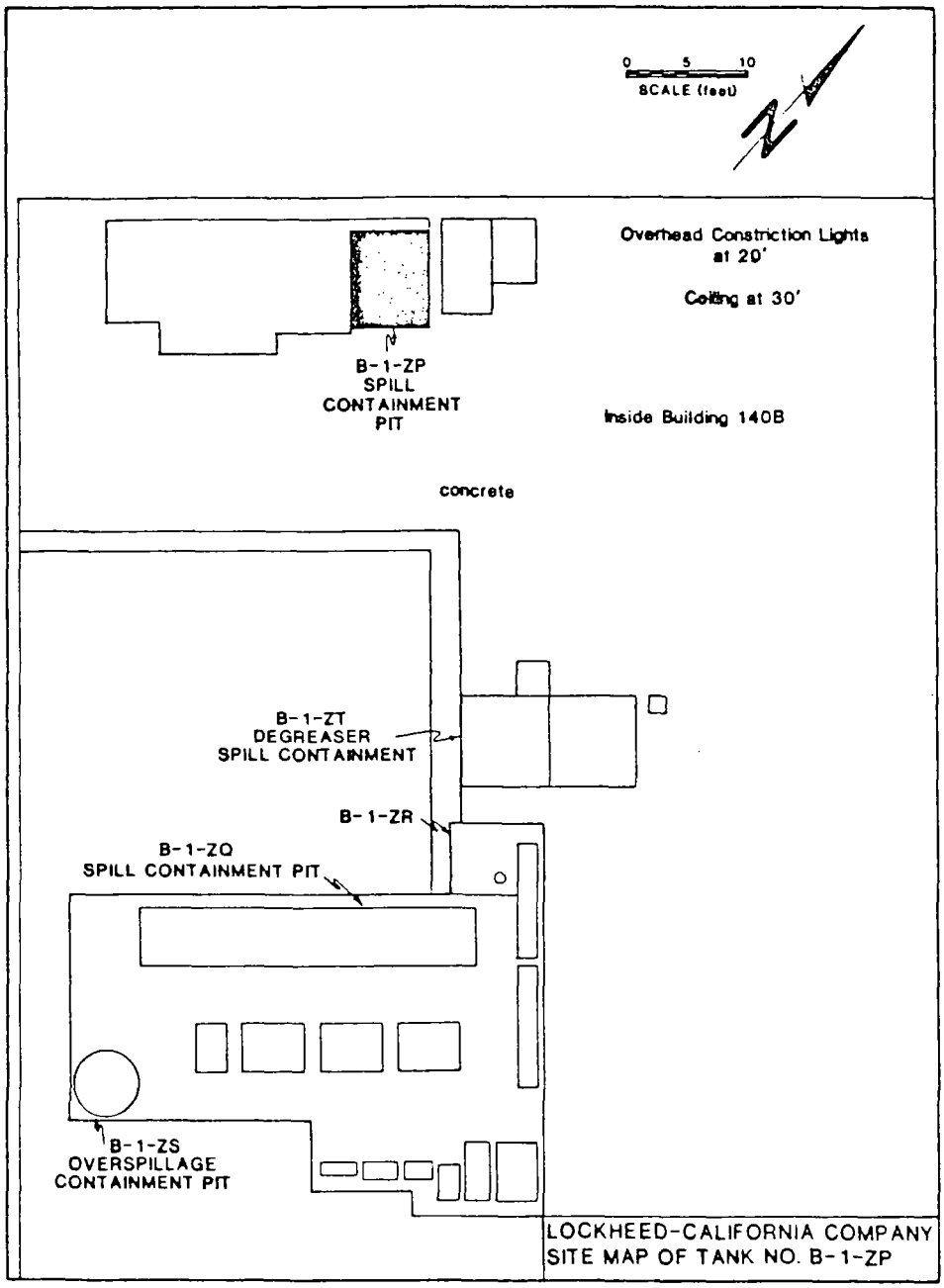

LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZO


0
5
10
SCALE (feet)
TO BE INSPECTED
Above Ground Tanks
and Piping
alley
B-1-ZO
50 gal
SPILL AND WASH-DOWN SUMP
Above
Ground
Tank
Above
Ground
Tank
Above
Ground
Tank
Building 119
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZO

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-ID
Plant No./Nearest Bldg.		B1/Bldg. 119 (Inside)
Tank:	Location	1705 Victory Place
	Installation Date	1984
	Capacity, gal.	50
	Use/Process	Reverse osmosis process spill and wash-down sump
	Contents (past,CAS No.,date)	None
	(present,CAS No.)	Sulfuric acid washdown 7664939
	Construction Materials	Concrete
	Geometry	Square
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	2.2 ft width
	Length (1)	2.2 ft length
	Containment	None
	Corrosive Protection (2)	Int. coated
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Concrete
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Inspection
	Borings (No.)	0
	Sample Depths	
	Vapor Wells/Lysimeters (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	0
	Parameters	


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZP


0 5 10
SCALE (feet)
Overhead Constriction Lights at 20'
Ceiling at 30'
B-1-ZP SPILL CONTAINMENT PIT
Inside Building 140B
concrete
B-1-ZT DEGREASER SPILL CONTAINMENT
B-1-ZR
B-1-ZQ SPILL CONTAINMENT PIT
B-1-ZS OVERSPILLAGE CONTAINMENT PIT
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZP

TANK B-1-ZP

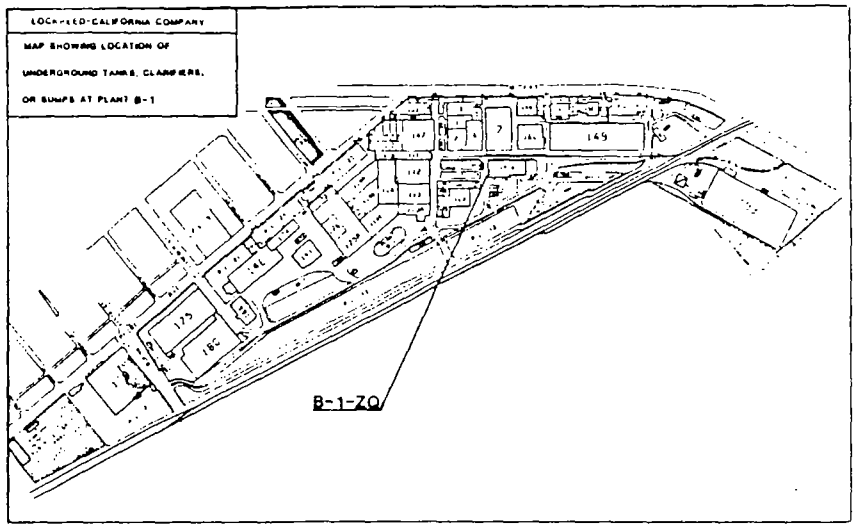
As proposed in the Work Plan, the integrity of Overspill Containment Pit B-1-ZP was to have been determined by visual inspection. However, further discussion with CALAC personnel and Mr. Al Novak of the RWQCB resulted in the decision that soil borings, soil analysis, and installation of suction lysimeters would provide more thorough information. Therefore, the overspill containment pit was investigated using two, 17.5-foot borings which have been converted to suction lysimeters. Soil samples were extracted from depths of 6 and 17.5 feet. The results of the field investigation and laboratory analysis of the samples will be added to this report when completed and available.

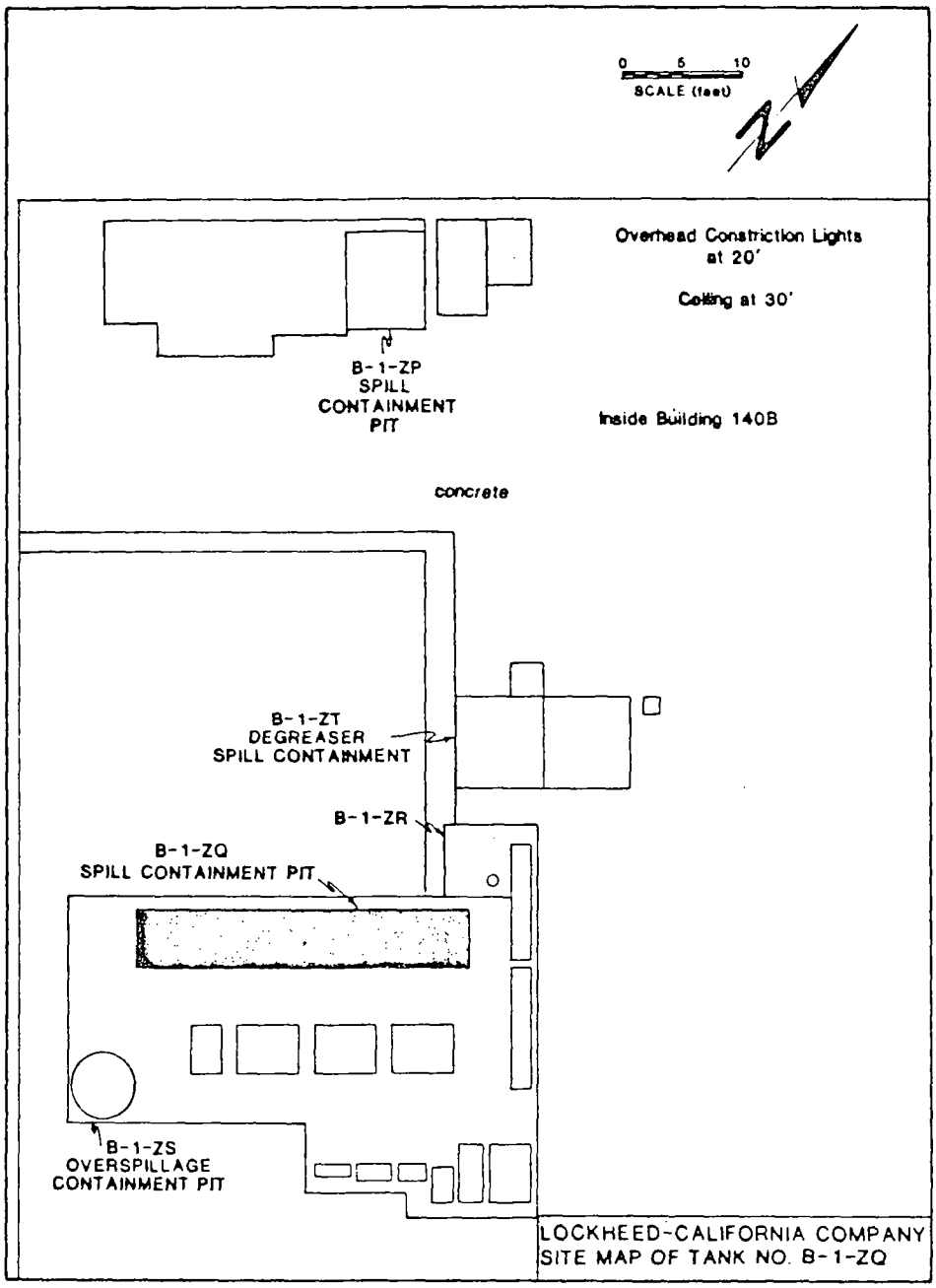
PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-ZP
Plant No./Nearest Bldg.		B-1/Bldg. 1408 (Inside)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	UNK
	Use/Process	Spill containment pit
	Contents (past,CAS No.,date)	Spillage from metal cleaning process
	(present,CAS No.)	Spillage from metal cleaning process
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	UNK
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Concrete
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Portable H.S.Auger
	Borings (No.)	2
	Sample Depths	B1/10,20 ft B2/10,20 ft
	Vapor Wells/Lysimeters (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	2(Comp.)
	Parameters	CAM,pH

TANK B-1-ZQ

As proposed in the Work Plan, the integrity of Overspill Containment Pit B-1-ZQ was to have been determined by visual inspection. However, further discussion with CALAC personnel and Mr. Al Novak of the RWQCB resulted in the decision that a soil boring, soil analysis, and installation of a suction lysimeter would provide more thorough information. Therefore, the overspill containment pit was investigated using one 20-foot boring which will be converted to a 10-foot suction lysimeter. Soil samples will be extracted from depths of 6 and 20 feet. The results of the field investigation and laboratory analysis of the samples will be added to this report when completed and available.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZQ


0 5 10
SCALE (feet)
N
Overhead Constriction Lights at 20'
Ceiling at 30'
B-1-ZP
SPILL
CONTAINMENT
PIT
Inside Building 140B
concrete
B-1-ZT
DEGREASER
SPILL CONTAINMENT
B-1-ZR
B-1-ZQ
SPILL CONTAINMENT PIT
B-1-ZS
OVERSPILLAGE
CONTAINMENT PIT
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZQ

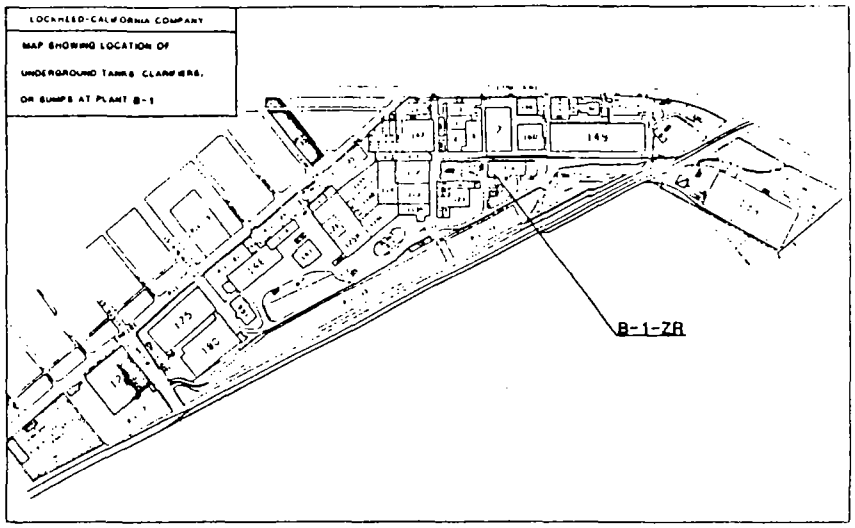
PERTINENT CONSTRUCTION AND PROGRAM DATA

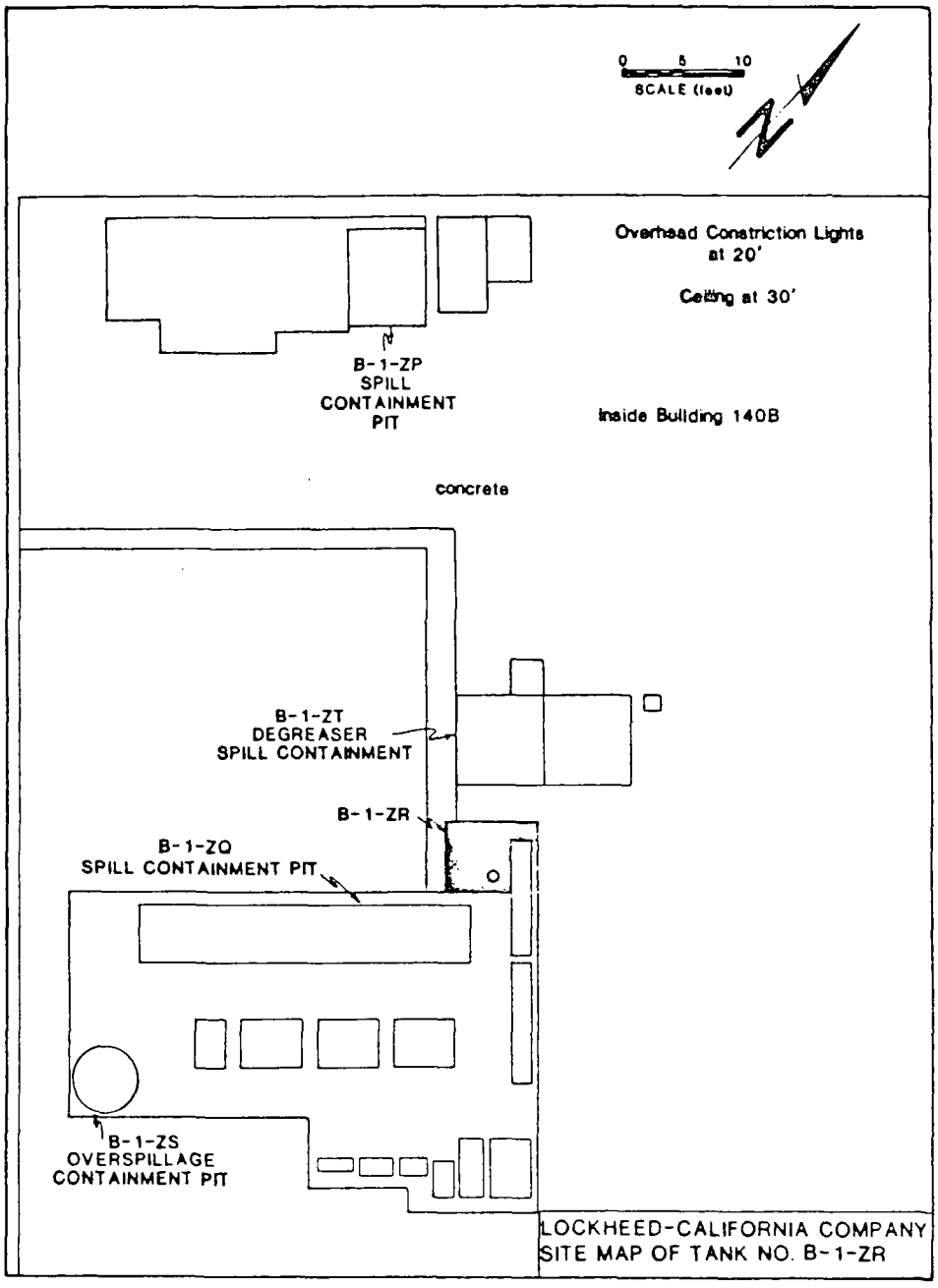
Tank No.		B-1-ZQ
Plant No./Nearest Bldg.		B-1/Bldg. 140B (Inside)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	UNK
	Use/Process	Spill containment pit
	Contents (past,CAS No.,date)	Spillage from metal cleaning process, cyanide
	(present,CAS No.)	Spillage from metal cleaning,cyanide
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	UNK
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Concrete
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Portable H.S.Auger
	Borings (No.)	1
	Sample Depths	B1/10,20 ft
	Vapor Wells/Lysimeters (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	1(Comp.)
	Parameters	CAM,Cl,pH,CN

TANK B-1-ZR

As proposed in the Work Plan, the integrity of Overspill Containment Pit B-1-ZR was to have been determined by visual inspection. However, further discussion with CALAC personnel and Mr. Al Novak of the RWQCB resulted in the decision that a soil boring, soil analysis, and installation of a suction lysimeter would provide more thorough information. Therefore, Overspill Containment Pits B-1-ZR and B-1-ZT (see Tank B-1-ZT) were investigated using one 20-foot boring which will be converted to a suction lysimeter. The proximity of the pits make it possible to monitor both systems with a common lysimeter. Soil samples will be extracted from depths of 6 and 20 feet. The results of the field investigation and laboratory analysis of the samples will be added to this report when completed and available.

0837


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZR

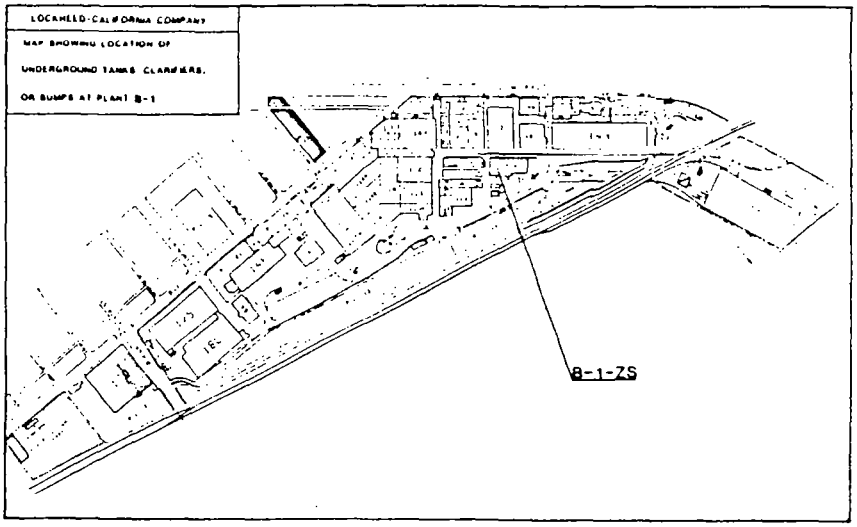

0 5 10
SCALE (feet)
N
Overhead Constriction Lights
at 20'
Ceiling at 30'
B-1-ZP
SPILL
CONTAINMENT
PIT
Inside Building 140B
concrete
B-1-ZT
DEGREASER
SPILL CONTAINMENT
B-1-ZR
B-1-ZQ
SPILL CONTAINMENT PIT
B-1-ZS
OVERSPILLAGE
CONTAINMENT PIT
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZR

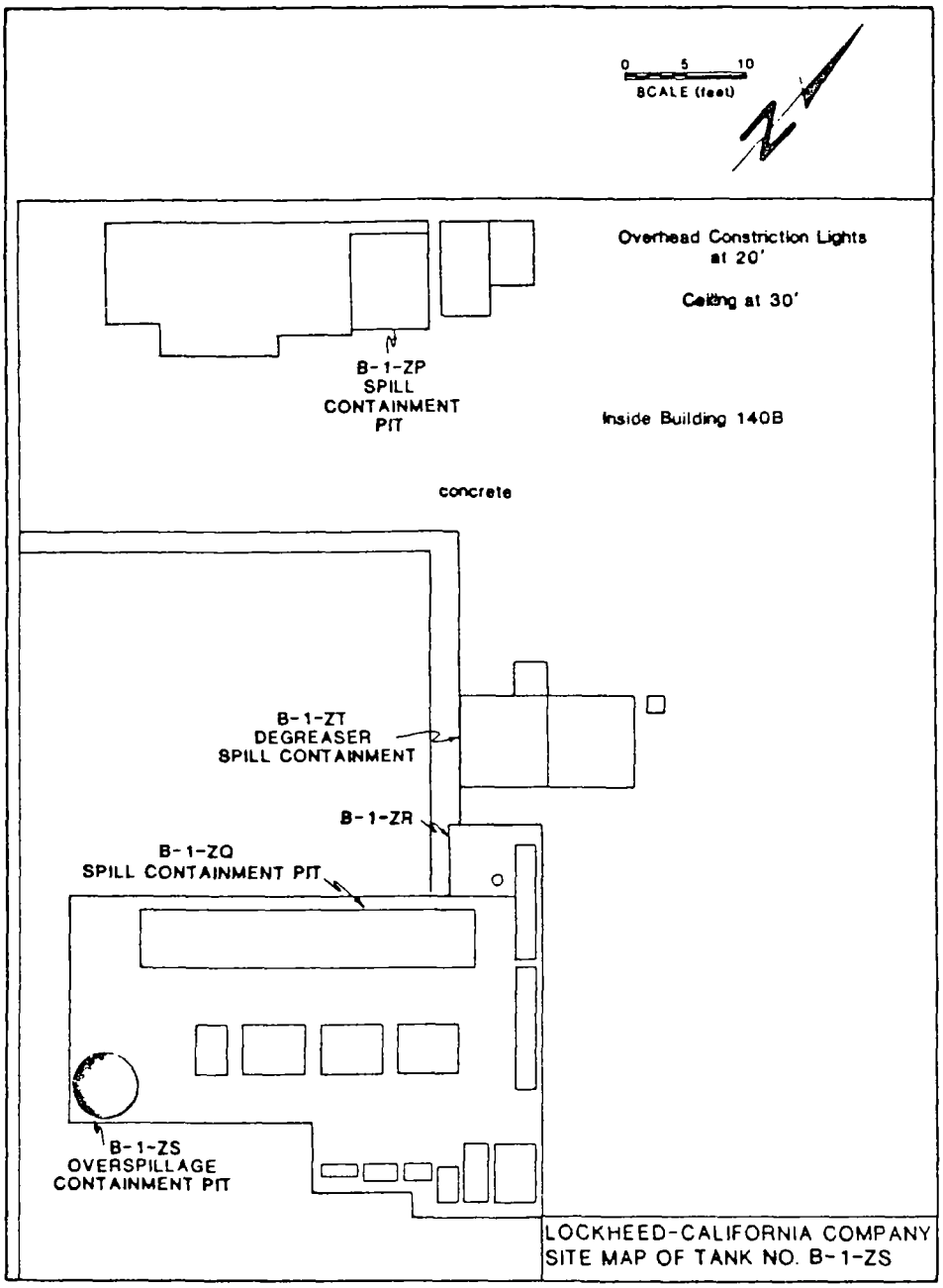
PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-IR
Plant No./Nearest Bldg.		B-1/Bldg. 1408 (Inside)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	UNK
	Use/Process	Spill containment pit
	Contents (past,CAS No.,date)	Metal cleaning spillage, HCL,surfactants
	(present,CAS No.)	Metal cleaning spillage, HCL,surfactants
	Construction Materials	Concrete
	Geometry	Rectangular
	Depth To Top	UNK
	Depth To Invert	UNK
	Diameter	UNK
	Length (I)	UNK
	Containment	None
	Corrosive Protection (2)	UNK
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Concrete
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Portable H.S.Auger
	Borings (No.)	1
	Sample Depths	B1/10,20 ft
	Vapor Wells/Lysimeters (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	1(Comp.)
	Parameters	CAM,Cl,pH Vol.Org.

TANK B-1-ZS

As proposed in the Work Plan, the integrity of Overspill Containment Pit B-1-ZS was to have been determined by visual inspection. However, further discussion with CALAC personnel and Mr. Al Novak of the RWQCB resulted in the decision that a soil boring, soil analysis, and installation of a suction lysimeter would provide more thorough information. Therefore the pit was investigated using one, 18-foot soil boring which was converted to a suction lysimeter. Soil samples were extracted from 8 and 17 feet. The results of the field investigation and laboratory analysis of the samples will be added to this report when completed and available.


LOCKHEED-CALIFORNIA COMPANY
MAP SHOWING LOCATION OF
UNDERGROUND TANKS, CLARIFIERS,
OR SUMPS AT PLANT B-1
B-1-ZS


0 5 10
SCALE (feet)
N
Overhead Constriction Lights at 20'
Ceiling at 30'
B-1-ZP SPILL CONTAINMENT PIT
Inside Building 140B
concrete
B-1-ZT DEGREASER SPILL CONTAINMENT
B-1-ZR
B-1-ZQ SPILL CONTAINMENT PIT
B-1-ZS OVERSPILLAGE CONTAINMENT PIT
LOCKHEED-CALIFORNIA COMPANY
SITE MAP OF TANK NO. B-1-ZS

PERTINENT CONSTRUCTION AND PROGRAM DATA

Tank No.		B-1-ZS
Plant No./Nearest Bldg.		B-1/Bldg. 140B (Inside)
Tank:	Location	1705 Victory Place
	Installation Date	UNK
	Capacity, gal.	UNK
	Use/Process	B-1-ZR overspillage containment pit
	Contents (past, CAS No., date)	Sodium cyanide
	(present, CAS No.)	Caked substance in bottom Sodium cyanide
	Construction Materials	Steel
	Geometry	Cylindrical
	Depth To Top	UNK
	Depth To Invert	8 ft
	Diameter	5 ft
	Length (1)	UNK
	Containment	None
	Corrosive Protection (2)	UNK
	Status	In service
Tank Piping:	Number	UNK
	Type	UNK
	Construction Mat.	Steel
Site:	Paving Material/Thickness	Concrete
	Appearance	UNK
	Surface Contamination	UNK
Drilling Program:	Rig Type/Requirements (3)	Portable H.S.Auger
	Borings (No.)	1
	Sample Depths	8'/10,20 ft
	Vapor Wells/Lysimeters (No.)	0
	Sample Depths	
	Completion Interval	
Laboratory Program (4)		
	No. of Tank Content Samples	0
	Parameters	
	No. of Tank Soil Samples	1(Comp.)
	Parameters	Cn